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PERFORMANCE OF COOPERATIVES IN NORTHERN THAILAND: A CASE STUDY OF SANPATONG AND HANGDONG COOPERATIVES

BY

© JEFFREY DEAN WARD

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfilment of the requirement for the degree of Masters of Science.

In

Agricultural Economics

DEPARTMENT OF RURAL ECONOMY

EDMONTON, ALBERTA

SPRING 1995

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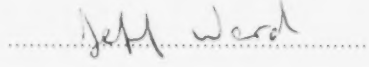

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled Performance of Cooperatives in Northern Thailand: A Case Study of Sanpatong and HangDong Cooperatives submitted by Jeffrey Dean Ward in partial fulfilment of the requirements for the degree of Masters of Science in Agricultural Economics.

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February 9, 1995

ABSTRACT

The study was undertaken to evaluate the performance of cooperatives in Thailand from the farmers' perspective. This was achieved by analyzing two multipurpose cooperatives in Northern Thailand, the Sanpatong and HangDong cooperatives. The study analyzed and compared the farmers' assessments of the market agents, cooperatives and wholesalers, in the Sanpatong and HangDong districts, based on specific attributes or characteristics of these market agents.

The results of the study indicated farmers find that cooperatives in Thailand had the potential to improve market performance. The Sanpatong and HangDong cooperatives had attained an accomplished reputation amongst the farmers in the Sanpatong and HangDong districts. These cooperatives offered improved input supply services, were an alternative agent to borrow from, more accessible source of market information, a market agent perceived as sincere and honest, and giving an option to farmers of getting dividends. However, the wholesalers from Sanpatong and HangDong districts provided several other worthwhile services to the farmers such as a convenient location to sell their agricultural produce.

The study found that the farmers are perhaps best served by having the cooperatives and wholesalers competing in the same market for the farmers' loyalty. The cooperatives perform the services in the interest of the farmer and the wholesalers improve efficiency or productivity in the market.

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I Introduction

1.1 Background to the Study

The economy of Thailand has experienced remarkable growth in GNP, averaging about 7 percent increase in real terms per year during the past two decades. The agricultural sector's share of national output has decreased from more than 40 percent in 1960 to about 17 percent in 1990, while the manufacturing sector has increased its share of the national output from a little over 10 percent to about 23 percent during the same period (Asian Productivity Organization, 1992). The economic growth and structural change that has occurred has doubled the per capita income over the period and yet farmers' incomes remain very low. The farmers' incomes are often lower than the poverty line which the National Economic and Social Development Board (NESDB) specified as 3,666 baht[1] in 1986 (Asian Productivity Organization, 1992). Today, in terms of employment, agricultural producers approximate 65 percent of the labor force. Therefore, as stated by the Asian Productivity Organization (1991) report, it would seem that any development effort by the government can hardly succeed if it fails to address the economic and social concerns of small farmers.

In 1981, the Government of Thailand rated the improvement of the agricultural sector as a top priority of the national economic and social development programme. Government also generally recognized that agricultural cooperatives were an essential measure to help improve productivity in the agricultural sector. Suphaphiphat (1979) expressed the opinion that agricultural cooperatives could be expected to contribute significantly to the national economy and the social progress of the rural sector by increasing agricultural productivity, and improving the farmers' bargaining power in marketing their farm products.

Cooperatives are not new to Thailand, and in fact, date back to as far as 1916 (Toommanee,

---

[1]The exchange rate on Feb.9, 1995 was approximately 18 Thai baht to 1 Canadian dollar

1991). However, despite growth in the cooperative sector ever since that time, cooperatives have been only modestly successful. In the 1960s, the government recognized the failure of many cooperatives and began promoting the amalgamation of small rural credit societies into larger multipurpose cooperatives at the district levels. It was believed by Toommanee (1991) that financial failures of cooperatives were often due to their limited nature as single-purpose cooperatives and that other cooperatives succeeded by consolidating and enlarging the nature of their operations into multipurpose cooperative associations responsible for marketing, processing, credit, and supply.

The government envisioned cooperatives at all levels working together to improve the balanced integration of services and operations, with active member participation in the operation, improved loan-repayments, greater volume of savings by members, improved farm practices and diversified production, and more group effort by members in general. Toommanee (1991) and Lamming (1980) have noted in their discussions that agricultural cooperatives have exhibited improved profitability, loan repayment, and efficiency of the organizational structure in general over the years; however, Toommanee (1991), Suphaphiphat (1979), Chalermvana (1982), Lamming (1980) and Jesdapidat et al. (1991) have countered that there continues to be numerous cooperative failures for many reasons discussed later in the paper. This is despite the government priority to promote agriculture cooperatives and inject large sums of money to help establish or maintain cooperative organizations.

In an article by Toommanee in the Asian Productivity Organization (APO) report in 1991, the following measures were proposed as essential to the success of the cooperative movement:

(1) The policy on cooperative promotion be clear and unified.
(2) Cooperative staff members and farm members be continually improved by providing intensive training to them.
(3) The cooperative movement have its own financial institution in the form of a cooperative bank.
(4) The cooperative be exempt from some fees and taxes.
(5) Expand the membership to cover wider areas.
(6) The cooperative movement be coordinated with government organizations.

(7) Promote savings of the members and cause them to use their income more efficiently.
(8) Promote cooperation among the cooperatives in order to enhance managerial capability and provide better services.

1.2 Research Problem

The rural regions of Thailand are lagging the impressive growth rates occurring in urban regions such as Bangkok. For the rural regions to achieve better economic growth it has been considered by National Economic and Social Development Board (NESDB) important that performance in the agricultural sector improves. It has been argued by the NESDB that cooperative organizations may contribute to an improvement in the rural regions of Thailand. The research problem to be addressed in this study is to determine if cooperative organizations in Northern Thailand provide unique or beneficial characteristics not otherwise provided to rural farmers in Northern Thailand. Two multipurpose cooperatives, Sanpatong and HangDong cooperatives, are chosen to typify cooperatives who are successful in Thailand. These cooperatives are analyzed according to certain characteristics or attributes that have either been outlined in previous cooperative research studies or are considered to be important by the researcher for the circumstances prevalent in Northern Thailand. It is suggested that cooperative organizations such as the Sanpatong and HangDong cooperatives may provide some improvement or beneficial aspect not provided for by the other market, credit or supply agents.

1.3 The Objective

The main objective of this thesis is to provide an analysis of the benefits and disadvantages of a cooperative organization for agriculture in Thailand. To accomplish the primary objective, the study evaluates and compares the cooperative organizations and other marketing organizations from a given criterion. The criterion is based on attributes such as the purchase price of each of the products bought, credit made available to the farmers, inputs such as fertilizer, chemicals and seed

supplied, interest rate on loans to the farmers, location of purchase, storage made available, market information provided, training provided, level of trust, and dividends. The study focuses the criteria on two multipurpose cooperatives and their counterpart competitors, the wholesalers, in the Northern region of Thailand. The study critiques these organizations from the perspective of the rural farmers in this region. The study makes a comparison between farmers who sell agricultural produce to a cooperative and farmers who sell agricultural produce to the wholesalers by also comparing socioeconomic variables. The study trys to determine what attributes associated with each of the market agents are viewed as important and how these attributes may differ depending on whether the farmer sells to a cooperative organization or to a wholesaler. There is emphasis in the study on the following:

1) comparison of agricultural product pricing by the cooperative and other marketing agents;
2) services provided by the cooperative and other marketing agents;
3) credit arrangements by the cooperative and other agents.

The specific objectives of the thesis are to answer the following questions:

1) Are there differences in farmers perceptions of cooperatives and other market agents?
2) Are there differences in the decision-makers' choice between the cooperative or wholesaler depending on the agricultural product sold?
3) Are there differences between farmers versus managers perceptions of the cooperative(s)?
4) Are cooperatives necessary for helping the farmers increase agricultural productivity, and improving the farmers' bargaining power in marketing their farm products?
5) Are multipurpose cooperatives serving the needs of farmers?

1.4 Nature of the Analysis

There are a number of successful cooperatives in Thailand and they have a high level of member participation in their economic operations, good repayment ratio on loans, high volume of savings by members within the cooperatives and strong group effort by members in general. The Sanpatong and HangDong multipurpose cooperatives in Northern Thailand are generally considered to typify such successful cooperative enterprises. It is hoped that this study may provide important information for farmers, the Sanpatong and HangDong cooperatives, Cooperative League of Thailand,

agriculture extension officers in Thailand, and for the Government of Thailand to use under the guidelines of the National Economic and Social Development programme.

1.4 Thesis Organization

The thesis is divided into seven chapters. The first has provided the background to the study and introduced the nature of the problem.

The second chapter introduces the theoretical background on agricultural cooperatives, outlines cooperative market strategies and game theory, profiles issues concerning cooperatives in developing countries, and discusses the role of government. The chapter also includes a review of the performance of cooperatives in the Asian region.

In the third chapter, the study reviews the history, structure, and performance of agricultural cooperatives in Thailand. The focus of the chapter is to familiarize the reader with the historic record of cooperative organizations in Thailand and their progress to date.

The fourth chapter explains the study area, the cooperative organizations and the research methods. There is a discussion on the selection of the study area, general description of the study area, an explanation of the sample selection process, details on the Sanpatong and HangDong cooperatives, outline of the objectives of the questionnaire and a discussion of the method of data collection.

The fifth chapter presents the data obtained from the interviewing process and the discussion of the findings in the context of the socioeconomic profile, economic profile, marketing profile, and the credit profile. The chapter analyzes the characteristics of the individual farmers and breaks down the different attributes characteristic of the marketing agents, lending agents, and the input supply agents.

The sixth chapter provides data analysis using tabulation tables and empirical econometric

models; and a discussion evaluates the results of their application. Binomial and multinomial random utility models are used to analyze the data from the interviews. The final chapter summarizes the important findings of the study and its limitations and implications for further study.

II Theoretical Background on Cooperatives

2.1 Introduction

In many countries, there has been a concerted effort by people with a common interest to work together as groups and combine their scarce resources in the formation of an organization called a 'cooperative'. Because of economies of scale the cooperative provides a potential means of improving peoples' lives while maintaining peoples' independence and their way of life. Within this context, agriculture producers have formed cooperative associations to defend and look after their own needs in obtaining credit, purchasing and marketing, transportation, obtaining inputs, and other services.

The agriculture cooperative in its ideal form is defined as a democratic, self-reliant organization owned and managed by members who contribute share capital, time, and labor for the purposes of achieving efficiency and improving their economic position through an increase in revenue and a reduction of costs with a better provision of services (Braverman et al.,1991).

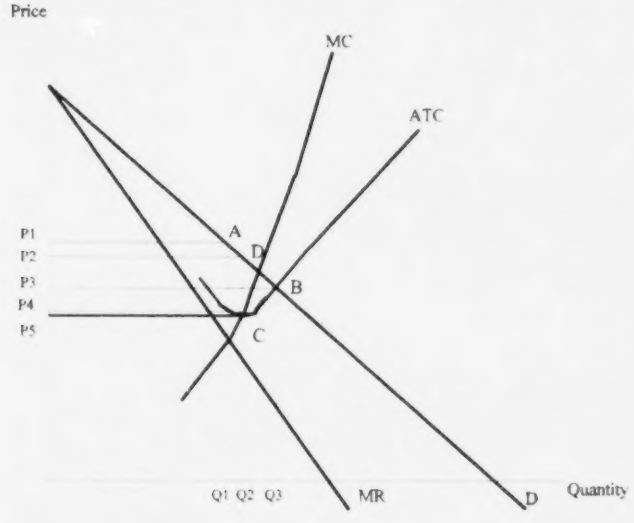
2.2 Cooperative Market Strategies and Game Theory

The economic theory of cooperatives has been developed from cooperative principles and the assumptions about how cooperatives should operate. Early theory was outlined by Helmberger and Enke and more recent advancements by Sexton, Staatz and Cotterill. The theory as summarized in this subsection should help clarify the arguments concerning the conduct and performance of cooperatives as defined by the authors above. The approach taken is based on the assumption that cooperative organizations have predetermined objectives that may be different than those of investor oriented firms (IOF). For example, the cooperative may want to secure maximum return to members rather than maximum return to shareholders. The cooperative, like its counterpart the IOF, may also intend to maximize operational efficiency, maintain and expand facilities, plan to increase market

share, and achieve a reasonable return. However, the cooperative organization's objectives and the IOF's objectives could differ if the cooperative's main objective is not to maximize profit. For example, the cooperative's main objective as a supply cooperative could be to minimize the price the member pays for input supply, equate average revenue with average total cost, or to maximize the total returns to members as a group.

In the diagram below, Figure 1, the different approaches that a supply cooperative operating in an imperfect market and environment could follow are outlined.

Figure I: Supply Cooperative Analysis

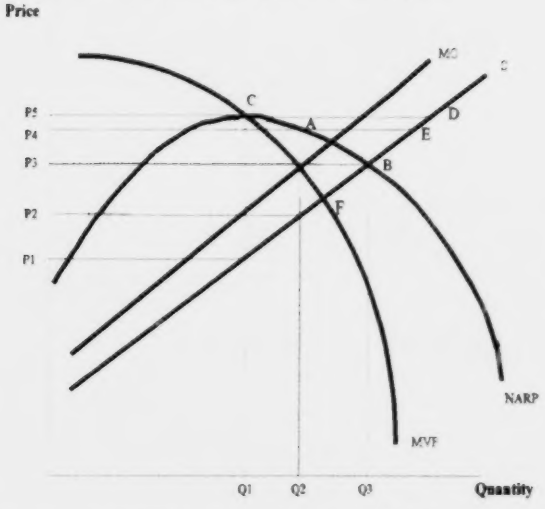


Source: Schmiesing, Brian, "Economic Theory and Its Application to Supply Cooperatives," in Cooperatives in Agriculture, Edited by David Cobia, 1989

If the cooperative was to operate just as the IOF it would only sell Q1 to its members by charging price P1. At point A, the cooperative would maximize profit to return to the members as dividend payments. However if the cooperative was in a monopolistically competitive market, the cooperative could equate average total cost (ATC) with average revenue (D) and supply Q3 to its customers. At point B, the cooperative would realize a lower price but it would not capture above normal profit as it would if it were to maximize profit. The cooperative could maximize surplus

returns to patrons by equating marginal cost (MC) and average revenue (D) at point D. The other alternative would be for the cooperative to minimize the price charged to its members by charging price P5 where MC is equal to ATC. At point C, the cooperative would have an unstable equilibrium where the members are wanting to buy more than the cooperative could supply at the price to equate ATC=D. To achieve the minimum price the cooperative would have to either charge a higher initial price at P2 and return the profit to the members, (assuming the members don't link initial price with dividends distributed), or restrict the quantity of supply the members could buy from the cooperative. The case for the supply cooperative, the marketing cooperative's objectives and those of the IOF may be different if the cooperative is trying to maximize the price received by members instead of maximizing profit, if it is trying to only break even by equating net average revenue product (NARP) with supply (S), or is maximizing the patron surplus where supply (S) is equal to marginal value of product (MVP). In Figure 2, alternate approaches the marketing cooperative could follow are outlined.

Figure 2: Marketing Cooperative Analysis



Source: Schmiesing, Brian, "Theory of Marketing Cooperatives and Decision Making," in Cooperatives in Agriculture, Edited by David Cobia, 1989

If the cooperative organization maximizes profit like any IOF it would equate the price at P4 where marginal value product (MVP) is equal to marginal outlay (MO). However, at price P4 the individual producers have an incentive to increase output (e.g. until the supply reaches point E) but in this process, price is driven down and is therefore increased to B. The cooperative could not achieve point A, maximizing profit, unless they could somehow restrict output and clearly distinguish dividends from the output sold to the cooperative. If the cooperative's objective was to attain a break-even price, the price would be set where the producer's aggregate supply (S) intersects the Net Average Revenue Product, at point B. At this production level no profits would be made by the cooperative and hence the producer's profit would only be the producer surplus. At point B, producers lack an economic incentive to alter their output level from Q3. At production levels below Q3, the price would exceed the marginal cost of producing additional output and would therefore encourage producers to increase output until price goes down to P3 and output Q3 was reached. The cooperative could maximize the patrons' surplus by equating MVP and S at point F. The welfare of the patrons could be maximized by achieving an optimal combination of price and dividends distribution. Another alternative the cooperative may choose would be to maximize the price received by members by setting price where Marginal Value Product is equal to NARP. At point C, producers would receive a price P5, but the producers at this price would want to increase output to equate their marginal cost of production to the price received at point D. The maximum price, P5, could only be maintained if the cooperative was to restrict output at Q1 and somehow clearly distinguish dividend distribution from the price paid for the output sold.

If the cooperative organization was to maximize profit at point A or maximize the price received by members at point C, output would have to be controlled. The cooperative could restrict output only by implementing enforcement schemes such as marketing quotas, marketing orders, grading systems, penalty action, and/or by means of group member education. The most direct way

to do this would be to restrict membership or to restrict volumes of the product that could be sold by each member while allowing no new members. If the cooperative imposed quotas or some other measure of restriction, it would also likely need to enforce penalties for overproduction. The penalties, if strict enough, could ensure that overproduction would not be profitable for those producers who over produced. If the cooperative was successful in achieving higher prices for its members, it may have the consequence of establishing an entrance fee or cost for those who wanted to join the cooperative. The cost or fee would then represent a barrier to entry for new members.

An alternative way the cooperative could attain maximum profits without need for quotas or penalties would be if the members were educated about the need for cooperation in achieving their common objective and all members abided by the common rules set by the cooperative organization. However, then there are the problems associated with free-riders and common property rights.[2]

To illustrate the predicament of the free-rider in the context of the cooperative organization, Staatz (1978) used the concept of a 'prisoner's dilemma' where there are two individuals and two possible strategies, cooperating with the other player or defecting and acting independently. In the game, the payoffs to each player are higher if both cooperate, but there is an incentive for each player to defect even though each knows that their opponent is likely to do the same. There are two characteristics which lead to a pareto-inferior outcome, the individuals are unable to communicate with one another and the game is only played once. In the context of the cooperative, the prisoner's dilemma could result in unfavourable conclusions (e.g.lack of cooperation) because each individual need not join or patronize the cooperative leading to a gradual decline in the organization's ability to provide goods or purchase production. It could also be suggested from the prisoner's dilemma that members may not have an economic self-interest to try to discipline cooperative management because

---

[2]A free rider is an individual who benefits from a collective action but does not pay his or her share of its costs and common property rights occur when exclusion from the collective benefit is not possible or viable (Braverman et al.,1991).

for the individual the costs exceed the benefits. Collectively members have an economic incentive to ensure that cooperative management work for the interests of the cooperative.

If the strategic game outlined above was to be extended for more than one period, the outcome for the cooperative could be different. For example, the members may have an incentive to continue to cooperate in each period on the premise of the action by the opponent in the previous period. If the two individuals have learned to cooperate the actions in each period may be made for the collective good. The prevailing ideology may suggest that cooperative loyalty depends on the following hypotheses outlined by Staatz (1987):

(1) Cooperative loyalty is greater among those who will be farming for an indefinite period compared to those who are near leaving farming;

(2) Cooperative loyalty increases as the penalties for disloyalty are increased;

(3) A farmer's cooperative loyalty decreases as he or she becomes more indebted;

(4) Cooperative loyalty is greater in small cooperatives than in large ones.

Although in specific situations the free-rider problem may lead to inefficiencies or inequities, according to Cotterill (1987), in general, the free-rider problem may not be important. For example, Sexton (1984) asserted that the optimum level of patronage in any situation was dependent on the form of the individual demand or supply functions for members and potential members. If the members and nonmembers receive benefits from market price reductions on supplies or higher prices for production sold to the cooperative, the free-rider problem and production restrictions may not matter. As quoted from Sexton (1984), "even the most selfish members would have no incentive to limit entry into a co-operative which was operating in a range of increasing returns to scale." Besides, in the long run in a perfectly competitive market, the cooperatives and the IOFs will likely converge to the same level of output. It is only in the short run that surplus profits could be obtained by those in the market because excess profits in an open market would attract new firms or cooperatives to

enter. The survival of any cooperative ultimately depends upon the commitment of its members to the organization and the managers' commitment to the members.

2.3 Analysis of Agricultural Cooperatives

The cooperative enterprise may be organized for any number of specific purposes, such as facilitating access to credit, input supply, marketing, production, processing and so on. The cooperative may also combine any of these activities to form a multipurpose cooperative. The multipurpose cooperative may have several potential advantages. Cooperative members can save time by going to one location to satisfy several different needs. The cooperative enterprise benefits from a more efficient organization because of economies of scale. There is a flow of information between cooperative management and members that may improve the results of one or more of the different activities. For example, interlinking marketing and credit operations may increase repayment rates for loans if the proceeds from the agricultural produce marketed to the cooperative can automatically be credited as loan repayments. Joining various operations may also increase the contact between members and management and enhance the incentive for more active participation by members. However, the argument against multipurpose cooperatives, is that the provision of many services entails complex organizational requirements and may overload management. There is the possibility of losing track of unprofitable activities within the overall operation of the cooperative (Bravermen et al, 1991).

One of the principle conditions for the favorable development of agriculture is adequate provision of credit at the right time and on reasonable terms. It is generally recognized that credit cooperatives have an important role in achieving a reliable, efficient credit system for agriculture. The usual functions of a credit cooperative include accepting deposits, making loans and handling remittances. The primary purpose of an agriculture credit cooperative is to make loans to enable the

farmer to purchase inputs such as chemicals, fertilizers, and improved farm equipment. The credit cooperative is usually more suited to the provision of short-term credit, usually for less than a year. As to long-term credit, cooperatives are usually reluctant to provide and handle such business.

Agricultural credit cooperatives may not be effective if they must entirely count on farmers' deposits as their major source of funds. It may be necessary for government to provide for loans to the cooperatives on short term or long term credit for an initial period of time.

There are a number of factors that differentiate agriculture credit from other forms of banking. For example, agricultural credit may have the following unique problems: an inadequate infrastructure to equate borrowing and lending; payment schedule in constant flux due to unstable prices and inconsistent output of agriculture produce; and influence by inconsistent government policies.

A supply cooperative may be an appropriate organization to provide farmers with necessary inputs of assured quality, at a reasonable cost for production. The supply cooperative may also help introduce and inform farmers about new varieties of seed, fertilizers, agricultural chemicals, new farm techniques, and equipment.

The creation of a marketing cooperative may produce an efficient or more efficient marketing system by increasing the competition in marketing of farm commodities and by providing more outlets for the farmers to dispose of their produce. The marketing cooperative may potentially increase farmers' incomes by improving their negotiating position in the sale of their product, reducing profit-margins and applying standards of type and quality of the product produced such that it meets the needs or wishes of customers (Van Dooren, 1982).

Marketing cooperatives may have potential problems in a competitive market. For example, marketing cooperatives need an adequate and continuous supply of agricultural produce to remain successful and they must compete on price with the private middlemen for the produce of members

or potential members. The cooperative must either arrange contractual obligations with its members or depend on the loyalty of members for regular deliveries because a well-financed private marketing agent could offer a higher price for the farmers' produce. The cooperative could be forced out of the market if the cooperative was unable to match the financial resources of the private agent(s).

2.4 Analysis of Cooperatives in Developing Countries

Cooperative organizations may have an important role to fulfill for many farmers in developing countries such as the potential to help rural farmers finance and market their produce at a reasonable price. At the same time they face numerous problems or difficulties characteristic of these regions such as illiteracy, lack of economic knowledge, poverty, malnutrition, exploitation, and so on.

The credit cooperative provides an alternative credit source for the farmers exploited by money lenders who provide credit only at very high interest rates and under very inflexible conditions. There is also the difficulty of getting a loan from money lenders and other credit institutions who tend to favor the large agricultural and nonagricultural operations. The private credit agencies prefer to lend limited financial resources to large organizations whom they have better information on and they perceive are more efficient and better managed. The credit cooperative may be suited to many of the conditions facing small farmers in developing countries. For example, in a village credit cooperative, the members are likely to know each other and are in a position to judge their fellow members' needs and creditworthiness. As well they are likely to see that the loan is properly applied to the purpose for which it was meant. The credit cooperative is also likely to be more flexible on payment conditions and willing to provide loans at a reasonable interest rate.

Small farmers in developing countries are likely to have little of the needed savings to finance a credit cooperative. To establish and maintain a credit cooperative, the organizers must arrange

financing at least from external sources such as the government or other institutional organizations. This may create a difficult problem, as dicussed in the Asian Productivity report in 1991, whereby small farmers who have little or no money invested in the cooperative and who may believe the cooperative is little more than a government 'welfare agency' may be inclined to feel no obligation to repay their loans. The credit cooperative could hold the farmers' land as collateral but many small farmers may have little or no land available for collateral.

Small farmers in developing countries are likely to have little or no negotiating power to achieve a fair price for their produce from the middlemen marketing and processing their produce. As such, small farmers may have more potential to achieve a reasonable price for their produce if the producers are also the middlemen as members of a cooperative directed toward the marketing of such produce.

2.5 The Role of Government in Cooperatives in Developing Countries

The development of cooperatives does not take place spontaneously in developing countries. Governments usually take a role in inducing farmers to combine to form a cooperative enterprise. The government may become involved in legislation, initiation and financing, often by establishing a government agency to assist and supervise the development of a cooperative organization under guidelines of appropriate legislation. The government agency supervises the internal dynamics, incentive and control structures, and membership education with respect to the specific economic, political, and cultural environment. The government agency may also engage in research, training of employees in the cooperative, ensuring effective auditing, short-term and long-term financial support, and ultimately establishing the integration of cooperative societies as a cooperative federation to facilitate the cooperative organizations to self-reliance and self-government (Asian Productivity Organization, 1973).

Braverman et al. (1991) have suggested that it is the role of the government to act as a catalyst in helping the farmers mobilize their own human, financial, and productive resources but it is important the government not become a permanent and/or dominant structure in the daily operation of the cooperative enterprise. The primary purpose of government involvement is to develop a conducive environment for local initiative by the cooperative members and the cooperative employees. Government should recognize that the effort and the approach to development are more important than the provision of significant financial resources. Braverman et al. also thought that the government should be limited to specified conditions in which government financial help is available to the cooperative enterprise and specify when the cooperative must be capable of surviving without any assistance.

2.6 The Performance of Cooperatives in Other Asian Countries

Agriculture cooperatives were initiated in most countries of Asia as credit cooperatives in the beginning of the century by their respective governments. By 1922, cooperatives had become legal entities in all the countries in the Asian region (Sharma, 1991). Recently, governments in the region have begun a process of amalgamating small village credit cooperatives into multipurpose cooperatives to meet the broader needs of farmers at the village level.

Generally, governments in the Asian region have given substantial support to the promotion and development of agricultural cooperatives. The degree of support ranged from entirely government initiated cooperative organizations to cooperative organizations receiving training, financial, managerial, subsidy, and/or preferential assistance from the government (Asian Productivity Organization, 1991).

In three countries in the Asian region, Bangladesh, Indonesia, and the Philippines, specific constitutional provisions exist for cooperative development. In some other Asian countries, according

to the Asian Productivity Organization (1991), governments committed support to cooperatives either through declared policies or their development plans. The government was involved with cooperatives in carrying out support price operations in India, Indonesia, Japan, Sri Lanka, Thailand and this government support may have helped build up the infrastructure facilities like warehouses, processing units, etc., in cooperatives (Asian Productivity Organization, 1991).

The structure of cooperatives in the Asian region was usually designed in three tiers from the model of the Japanese system. The Japanese system has a primary cooperative at the village level, secondary at the provincial level, and all of the primary and provincial cooperatives are involved at the national level. The initiation comes from the national level federations but actual planning and implementation is done by the primary cooperatives. The other countries in the Asian region, such as Thailand and the Philippines, have copied the Japanese model. An exception is the Korean cooperative system, where all activities above the primary village level are carried out in a single federation (Asian Productivity Organization, 1991). In the Korean model the initiation and planning come from the National federation. In both models, there are effective linkages between the different cooperatives and the different levels. The Korean system has simplified the structure of the hierarchy but by doing so, the system may have restricted the initiative of those at the primary level.

In most Asian countries, the cooperatives and even their federations have not been able to diversify the nature of their operations. The Asian Productivity Organization (1991) indicates that in most cases the cooperative organizations are confined to credit, and in some cases they may supply inputs, but they are rarely involved in the marketing of agricultural products for selling either in the domestic or export markets. Very few cooperatives have developed the necessary infrastructure for storing, transporting, and/or processing the agricultural products.

Government support has helped to expand the number of agricultural cooperatives in their respective countries but the result has often been an overdependence of the cooperatives on

government financial support. This financial support of government has resulted in an increase in the involvement of the government in the cooperative enterprises. This has according to Sharma (1991), weakened the relationship between the cooperatives and their members.

The Asian Productivity Organization (1991) reported that the number of agricultural families participating in cooperatives varied from 100% in Japan, 90% in Korea, over 60% in India, Bangladesh, Nepal, and Sri Lanka, and between 10% and 16% in Indonesia, Philippines and Thailand. The different rates of participation of cooperatives for each of the countries may be due in part to the stage of economic development of the country and the ideology of the government. For example, Sharma (1991) stated that immediately after the war, cooperatives in Japan were mismanaged, suffered losses, and were as bad as elsewhere in Asia but with proper planning, the cooperative movement had become the strongest in the world.

Recently, there has been a trend toward solidifying existing organizations to improve operational efficiency and cost effectiveness. The number of agricultural cooperatives were considerably reduced in Japan, the Republic of Korea, India and Sri Lanka.

In the 1991 APO report the average size of membership of primary agricultural cooperatives was 34 members in Pakistan, 42 members in the Philippines, 55 members in Bangladesh, 1,875 members in Japan, 1,329 members in Korea, and as high as 7,607 members in Sri Lanka and 2,337 members in Indonesia. The study found no apparent correlation between the success of a cooperative and the membership size. For example, in Sri Lanka the number of cooperatives was reduced from more than 11,000 to 285 with an average membership of 7,607; however, the overall improvement in the operation of the Sri Lankan cooperatives seemed to have been only marginal. On the other hand, with very low membership in Bangladesh, Pakistan and the Philippines it was observed by the Asian Productivity Organization (1991), that cooperatives couldn't maintain a cohesive and loyal membership to provide a variety of other services.

In countries such as Japan, Republic of Korea, Peoples' Republic of China and India, cooperatives have contributed substantially to agricultural production, marketing, and processing. Other countries in the Asian region such as Thailand have failed to improve substantially the conditions of rural families. Cooperatives in countries such as Thailand are operating cooperatives more as individual institutions than as an agricultural cooperative system (Asian Productivity Organization, 1991).

The cooperative movement in Asia, with the exception of Japan, South Korea, Peoples' Republic of China, has not developed self-reliant cooperative structures. There still do not exist effective linkages between the different levels of the cooperative hierarchy and furthermore, the membership remains low in numbers. As Sharma (1991) observed, "though progress has been made in many sectors, cooperatives still have a long way to go to build themselves into a well perceived and functioning economic system."

III Perspective on Thailand

3.1 History of Cooperatives in Thailand

In 1916, the first village credit cooperative in Thailand was established by the government to help relieve rice farmers from a credit shortage and to help the rice farmers expand their rice production. The cooperative movement was slow to expand during the early 1900s and agricultural cooperatives remained as small credit cooperatives at the village level. There were only 81 village credit cooperatives in 1927 (Machima, 1976:25). It was not until 1928 when the government created a new farm act to help promulgate various types of cooperative associations that there was a rapid expansion of cooperatives both in terms of numbers and types. This was due to the promotion of cooperatives by the government to meet the increasing needs of farmers.

Single-purpose cooperatives were formed to deal specifically with a variety of different needs of the rural farmers. For example, cooperatives supplied farm products for input needs such as seed, chemicals, and fertilizers, marketed and/or processed rice, and most importantly provided agricultural credit. The number of village credit cooperatives throughout the country increased rapidly between 1933 and 1952. By the end of 1952 there were about twenty types of agricultural cooperatives totaling 9,294 cooperative societies. The small credit cooperatives were the largest group, accounting for over 95 percent of the total number of cooperative societies (Suphaphiphat, 1979).

The first marketing cooperative in Thailand was organized in 1938 to help rice farmers. At the end of 1938, five marketing cooperatives had been formed and the number reached a peak of 118 marketing cooperatives in 1957.

The Bank for Cooperatives was organized in 1943 to provide financial assistance to the increasing number of agricultural cooperatives. It was replaced in 1966 by the Bank for Agriculture and Agricultural Cooperatives (BAAC). The BAAC had only five branches serving 24 agriculture areas at the end of its first year of operation. By 1989, it had 564 field offices staffed with credit

supervisors to appraise farm assets, assist in loan applications and provide training in credit use (Sharma, 1991).

The government introduced the first multipurpose production cooperative in 1959 as a pilot project. The cooperative was set up, according to Toommanee (1991), as an example of organizing group farmers at the district level sharing capital and increasing membership. In 1968, the government created a new cooperative act to improve the structure of the cooperative system. The act encouraged the amalgamation of single-purpose cooperatives with similar objectives into cooperative federations. As a result, the act also encouraged small village credit cooperatives to merge into multipurpose operations covering a wide range of activities that included the provision of credit and supplies, and the marketing and processing of farm products. The achievement of the amalgamation of small cooperatives into large multipurpose federations resulted in a smaller number of larger-sized agricultural cooperatives.

In 1981 the Thai government in response to an ineffective and inefficiently administered marketing system introduced a new cooperative marketing programme to link the activities of primary agricultural cooperatives and their federations at a provincial level into a cohesive system especially designed to supply credit and rice marketing activities. The objective was that all cooperative levels would work together to achieve a systematic management system to improve the efficiency of rice marketing, reduce marketing costs, improve farmers' income and loan repayments. Toommanee expressed an opinion that these measures had to some measure been successful. There were a number of successful cooperatives with a high level of member participation, improved repayment of loans, and a greater volume of savings by members. Furthermore, Toommanee quoted that the total business of cooperatives societies in the 1987 fiscal year was a respectable amount of 4,462 million baht, with a net profit of 297 million baht. On the other hand, Toommanee noted that there still remained a number of problems such as a lack of skilled labor to manage the cooperatives, detrimental

government policies and so on. As well, from 1981 to 1988 the volume of rice processed by agricultural cooperatives increased only from 115,452 mt to 120,019 mt.

3.2 Structure and Analysis of Cooperatives in Thailand

The structure of agricultural cooperatives is at three different levels, with "primary society" at the local or district level, "secondary society" at the provincial level, and the "apex society" at the national level. The interrelationship among the three different levels is illustrated in figure 3.

The primary society is comprised of individual farmers at the district or local level. Each primary society consists of various groups of farmers ranging from five to 30 groups. The purpose of the primary agricultural cooperative societies is to engage in the provision of agricultural inputs, marketing and processing activities such as rice milling.

The secondary level or provincial federation consists of an association of at least three or more societies in a particular area. The provincial cooperative federations purchase rice and other products from the primary cooperatives and from the farmers, and operate rice mills.

The national level consists of primary and secondary societies. The Agricultural Cooperative Federation of Thailand (ACFT) is the apex society of agricultural cooperatives throughout Thailand. The main activity of the ACFT is to supply agricultural inputs and market agriculture products obtained from the provincial cooperative federations. The ACFT also is responsible for exporting staple products such as rice and importing fertilizer to supply to the primary societies. All types of cooperatives at all levels are affiliates of the Cooperative League of Thailand (CLT). The purpose of the CLT is to promote and educate as well as represent the cooperative movement in Thailand.

Figure 3: Structure of Agricultural Cooperatives in Thailand

National Cooperative League of Thailand (CLT)

Agricultural Cooperative Federation of Thailand (ACFT)

Provincial

Provincial Federation

Primary

Agricultural Cooperatives

Sanpatong Cooperative **HangDong Cooperative**

Farm Members

The main business function for many agricultural cooperatives is to provide credit by accepting deposits and lending money. The cooperative provides credit to members both in cash and in goods, depending on the needs of the members. Normally, the cooperatives provide credit according to the members' production plans, members' income and their ability to repay the loan. According to the APO in 1991, the agricultural cooperatives only provided production loans, i.e., short-term loans maturing within 12-15 months, and medium-term loans maturing within three years at an interest rate of 12.5 percent per a year. The credit line for each member was set not to exceed 80,000 baht, and short-term loans were not to exceed 40,000 baht and loans could only be granted against joint liability of a group with not less than ten members. Loans above that amount had to be secured by a mortgage of immovable properties.

The Bank of Agriculture and Agricultural Cooperatives (BAAC) and the Cooperative Promotion Department (CPD) are the main sources of funds to finance the primary cooperatives. The BAAC provides credit to agricultural cooperatives and farmer organizations. The CPD promotes and supervises the cooperatives, establishes laws and regulations governing the operations of the cooperatives, and provides financial or material aid to the cooperatives.

Marketing is one of the most important activities of agriculture cooperatives. Cooperatives have been carrying out marketing for such crops as rice, soybeans, garlic, onions, maize, rubber, and sugar cane. In the first stage the local cooperative may buy or collect a product from its members and sell the product to a district cooperative or directly to a wholesaler in Bangkok. In the second stage, the district cooperative may sell or process the product, then sell it to the consumers in the area, or it may sell to the Cooperative League of Thailand (CLT). In the final stage, the product is either sold to the consumers in Thailand or exported.

Lamming (1980) in a FAO study, reported that there had been serious policy divergences between the BAAC and the CPD which, if left unresolved would impede cooperative activities. The ACFT was for all intents and purposes bankrupt. The report discussed the problems shown by survey done in 1978, which found 500 of 700 primary agricultural cooperatives lacked a full-time manager. Lamming stated his concern about the cooperatives' means to provide reliable services given the inadequate managerial personnel and their lack of managerial capability. Lamming found that there were virtually no efforts to develop an adequate system to supervise production loans to farmers or to ensure their repayment. The report stated that there was no systematic way for all farmers to obtain farm supplies at suitable prices, or to sell their products on more favorable terms than in the private market. The cooperative system had a duplication of effort and wastage of labor because several different departments in government were promoting cooperatives without coordination and without reference to any single government policy umbrella. Lamming also stated that although there had been improvements in member-participation, greater volumes of savings by members and even improvements in loan-repayments, that in the majority of cases the performance of agricultural cooperatives had been unimpressive. The report concluded that members believed or perceived that cooperatives were little more than channels for loans which recipients need not feel obligated to pay because members had little responsibility for a cooperative's success or failure. The report recommended the need to strengthen the management training programme for agricultural cooperatives, notably in order to promote the availability of management skills and improve the quality of available managerial personnel.

In a study in 1979 by P. Suphaphiphat for the years between 1954-1976 as reported in the book by David Wong, the extent of success and failure of cooperatives were measured by looking at the volume and growth of services and data on profit. Suphaphiphat compiled information on the loan-repayment ratios, members' deposits, value of purchase and sale, and rates of return. The success

of a cooperative was to be reflected from improvements in the loans-repayment ratio, increases in members' deposits, increases in the value of supplies that members purchased and value of products marketed by farmers through their cooperative, and improvements in the profit-capital ratio.

The success-failure index extracted from Suphaphiphat's study for the years between 1954-76 is in Table 1. The index is a composite derived on equal weight being put on each of the four elements selected; loan-repayment ratio, members' deposits, value of purchase and sale, and profit-capital ratio.

Table 1: Activities and Success-Failure Index of Thailand Agricultural Cooperatives between 1954-75 (1969=100)

	Loans-Repayment Ratio		Members' Deposits		Value of Purchase and Sale		Profit Capital Ratio		
Year	Ratio	Index	Baht	Index	Baht	Index	Ratio	Index	Success-Failure
1954	0.841	130.0	22.2	15.6	-	-	0.033	113.8	86.5
1955	1.016	148.5	46.5	32.6	-	-	0.032	110.3	97.1
1956	0.870	127.2	71.5	50.1	-	-	0.024	82.8	86.7
1957	0.706	103.2	94.1	65.9	-	-	0.023	79.3	82.8
1958	0.648	94.7	114.1	80.0	-	-	0.023	79.3	84.7
1959	0.900	131.6	163.9	114.9	-	-	0.023	79.3	108.6
1960	0.855	125.0	186.8	130.9	-	-	0.023	79.3	111.7
1961	1.020	149.1	223.5	156.6	-	-	0.023	79.3	128.3
1962	1.080	157.9	195.7	137.1	-	-	0.025	86.2	127.1
1963	1.027	150.1	246.7	172.9	-	-	0.029	100.0	141.0
1964	0.978	143.0	239.8	168.1	-	-	0.033	113.8	141.6
1965	0.790	115.5	237.6	166.5	-	-	0.036	124.1	135.4
1966	0.945	138.2	253.1	177.4	-	-	0.039	134.5	150.0
1967	0.797	116.5	211.1	147.9	-	-	0.034	117.2	127.2
1968	0.795	116.2	174.8	122.5	620.5	121.1	0.037	127.6	121.9
1969	0.684	100.0	142.7	100.0	512.2	100.0	0.029	100.0	100.0
1970	0.949	138.7	114.6	80.3	530.9	103.7	0.039	134.5	114.3
1971	0.932	136.3	98.4	69.0	579.9	113.2	0.034	117.2	108.9
1972	0.571	83.5	40.4	28.3	690.3	134.8	0.027	93.1	84.9
1973	1.008	147.4	79.6	55.8	798.1	155.8	0.038	131.0	122.5
1974	0.746	109.1	117.8	82.6	1041.4	203.3	0.036	124.1	129.8
1975	0.682	99.7	120.4	84.4	1071.3	209.2	0.046	158.6	138.0
Average	0.856	125.5	145.3	101.8	730.60	142.6	0.031	107.5	115.0

The values from the Table 1 indicate that agricultural cooperatives did not achieve much progress between 1954-1976 according to the measures the researcher observed. This was in spite of an average annual increase of 14.1% in government spending allocated to agricultural cooperatives. According to Suphaphiphat the failure of the government to achieve much progress in improving the cooperative system may be due to following reasons: dispersion of activities among different government agencies resulting in an obvious lack of coordination, duplication of efforts, conflicts of interest, and inefficient utilization of limited resources; politically motivated administration of cooperatives; direct control of the cooperatives by the government distorting the objectives of the cooperative.

In 1991, Dusit Jesdapidat et al. of the Maejo University conducted a study, "Improving Soybean Marketing Efficiency and Alternatives of Ban Maejo, Amphoe Maetan, Chiang Mai Province." They reported the following conditions in their study: a monopsonistic merchant; advances of production credit from the monopsonistic merchant; farmers sometimes obligated to sell their soybeans to the monopsonist in order to repay the credit taken earlier; farmers paying excessive real interest rates for their credit in the form of depressed local prices; no standard grading procedures; and prices that included a hulling fee that was charged for the use of the monopsonist's machine.

The conclusions from their study emphasized the need for the promotion of group marketing and for informal training that would allow farmers to better understand the marketing practices of soybean merchants. The farmers from Ban Maejo village expressed the desire for more training and a need for group marketing, but indicated they had little confidence in their ability to cooperate together in marketing their farm produce.

IV The Study Area and Research Methods

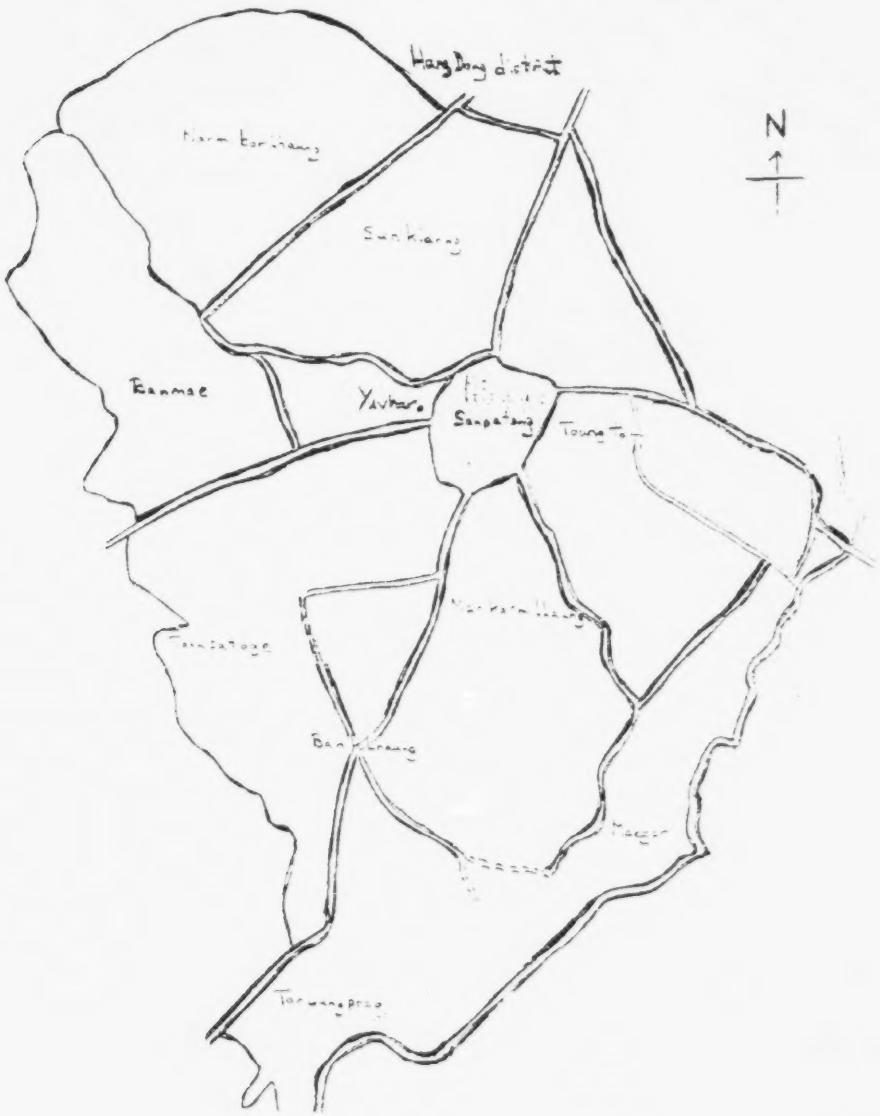
4.1 Selection of the Study Area

The study was conducted in the Sanpatong and HangDong districts which are approximately 15 kilometres south of the city of Chiang Mai. In the Sanpatong district there is the town of Sanpatong and another 92 villages. The HangDong district includes the town of HangDong and many other much smaller villages. Figures 4 and 5 are maps of the Sanpatong and HangDong districts.

The Sanpatong district is served by a multipurpose cooperative in the town of Sanpatong, by another cooperative purchasing onions in a rural village on the perimeter of the district, at least one, maybe two wholesalers in Sanpatong, and many wholesalers in the rural villages in the district. The HangDong district is serviced by the multipurpose cooperative in the town of HangDong and several wholesalers in the region. The Sanpatong and HangDong districts were selected for the study for several reasons such as the following: the two districts enclosed a wide choice of agents that farmers could use to market their produce, borrow financial resources, and obtain input supplies; the area provided a suitable setting to compare wholesalers and cooperatives or compare the two cooperatives with one another; the two cooperatives were cases of successful cooperatives in Northern Thailand; and the district was conveniently located to the city of Chiang Mai and Maejo University.

Figure 4: Map of the Sanpatong District in Northern Thailand

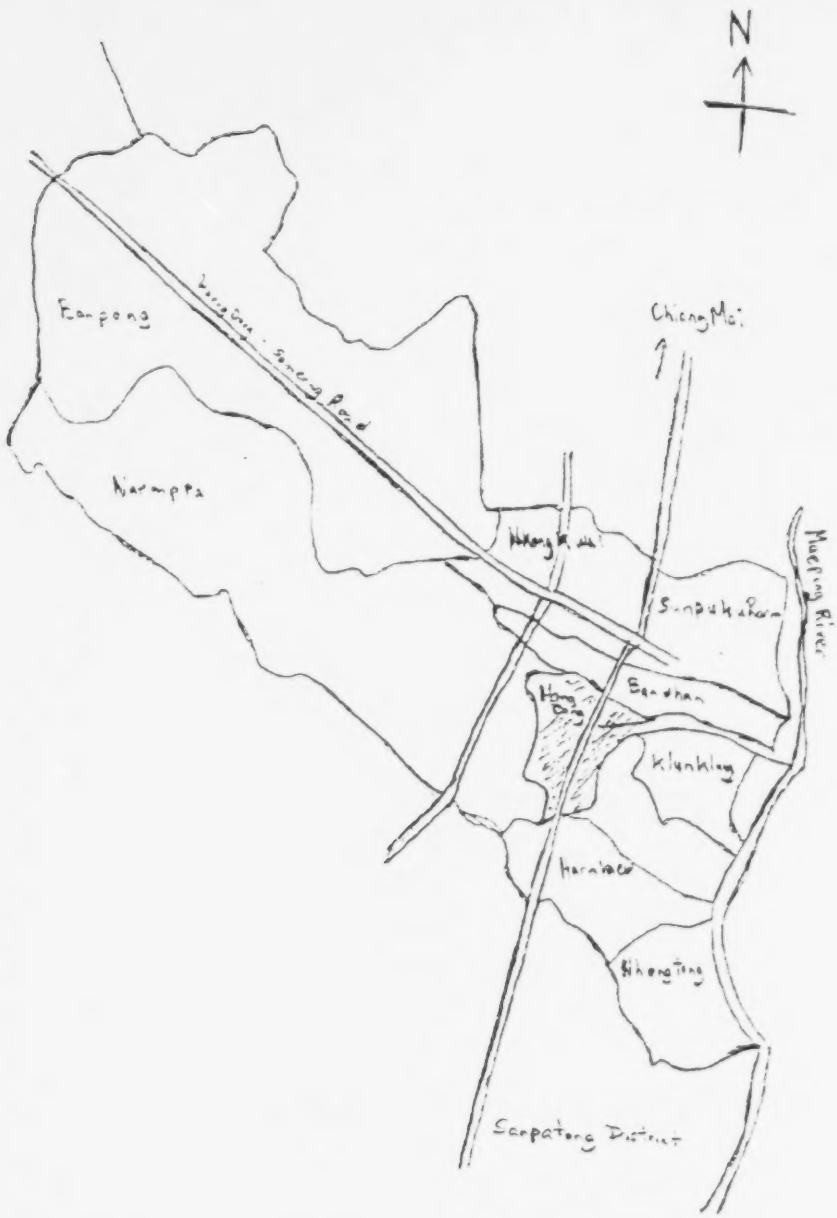
(Scale: The Sanpatong region is approximately 68,000 times the size of the one page map).



Source: The Sanpatong District Office

Figure 5: Map of the HangDong District in Northern Thailand

(Scale: The size of HangDong district is approximately half the size of the Sanpatong district).



Source: HangDong District Office

4.2 General description of the study area

The Sanpatong and HangDong districts include many small scale farmers harvesting staple products such as rice, soybeans, onions, garlic, and some growing 'logan' fruit. The farmers generally harvest one crop or two crops in each year by rotating their crops between rice and soybeans, garlic, or onions. According to the district handbook, the growing periods for rice, soybeans, and garlic grown in the region are the following:

Rice - July to May;
Soybeans - December to May;
Garlic - December to April.

Farmers often consumed some or all their rice production while selling their produce of soybeans, onions, garlic and remaining rice to their respective cooperative and/or wholesaler in their region. Some farmers further supplemented their income by having family members working in the factories in the surrounding regions.

The mean average land holding by each farmer interviewed from the Sanpatong district consisted of 4 rai[3]. Generally, few of the farmers had the means to irrigate their land and therefore they had to rely on nature. In most situations the farmers live close to each other in a village setting and from their village they can walk to their fields in the area surrounding the village site.

4.3 Selection of the sample

In the Sanpatong district six of the 10 subdistricts were included in the interviewing. The subdistricts in Sanpatong and the number of interviews made in each subdistrict are given in Table 2. The villages in the Banmae subdistrict and the number of interviews made in each village in the Banmae subdistrict are given in Table 3. There were 385 farmers interviewed from the Sanpatong district and of those, 269 were from the Banmae subdistrict.

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[3]Approximately 0.16 hectares or 0.395 acres are equivalent to 1 rai.

Table 2: Sanpatong SubDistricts

Subdistrict	# of Questions
Banmae	269
Narmbarlhaung	20
Toonsatoge	29
Markarmlhuang	19
BanKlaung	0
Maegar	22
Toonstom	3
Yuvharo	6
Sunklarng	17
Tarwungprao	0
HangDong	**35**
Total #	**420**

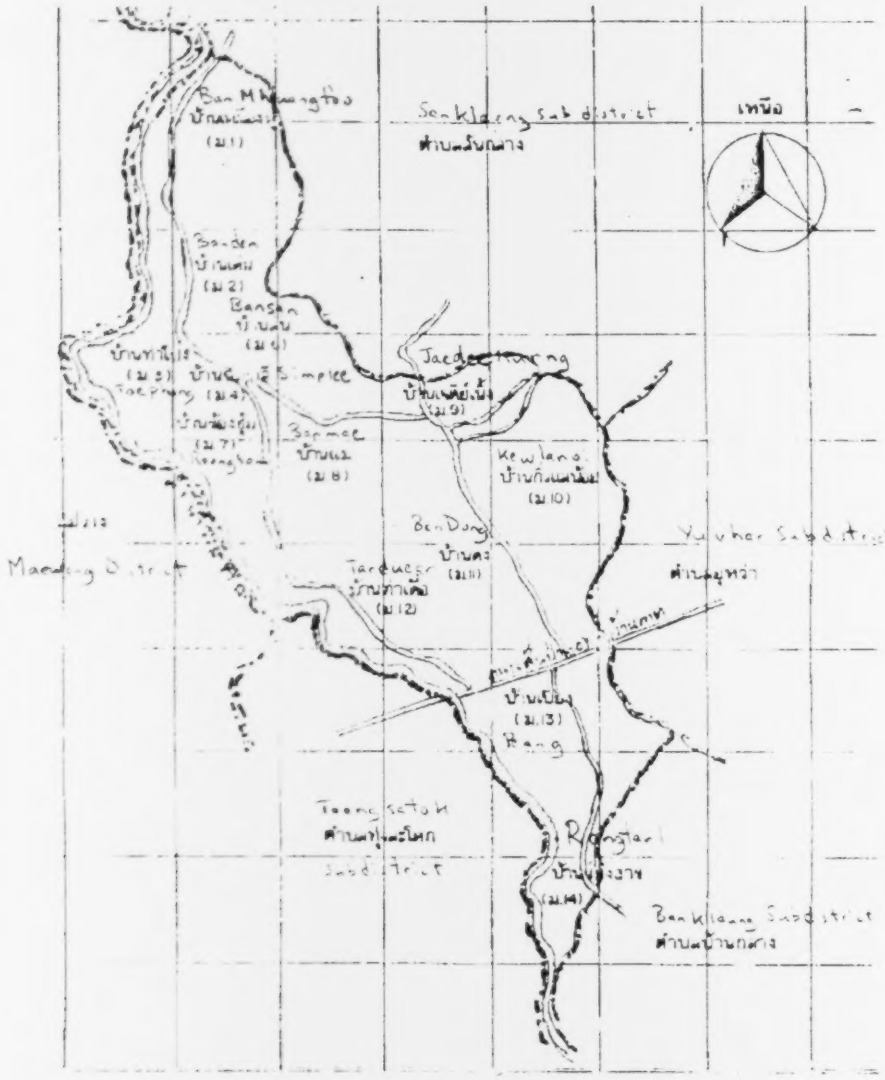
Table 3: Banmae Subdistrict

Subdistrict of Banmae	# of Questions
Banmae	24
Bansan	23
Banden	20
Ban Mhuang	20
Ban Dong	20
Tarduear	24
Peang	21
Rongtarl	18
Tarpong	20
Simplee	23
Jaedeenurng	14
Kewlanoi	20
Rangcoon	18
Total #	**269**

In figure 6 is the subdistrict map for the Banmae subdistrict.

Figure 6: Map of the Banmae Subdistrict in the Sanpatong District

(Scale: The scale of the Banmae subdistrict is approximately 50,000 times the area on the map on the page).



Source: Sanpatong District Office

The Banmae subdistrict was conveniently located 3 kilometres northeast of the town of Sanpatong. The farmers in the region predominantly grew rice and soybeans. The Banmae subdistrict was the focus of the study because of its convenience in location to the Sanpatong townsite and the appropriate crops grown in the region. A small number of interviews were taken from other regions in the Sanpatong district to add to or confirm the opinions of the farmers from the Banmae subdistrict. Four subdistricts were largely neglected in the interviewing process because they were deemed inappropriate for the reasons noted below.

In the Yuvharo subdistrict, bordering the highway from Chiang Mai through the Sanpatong district, the area consisted mostly of factories. It was the opinion of the translator that the area would be difficult to include in the interviewing process because there were only a small number of actual full time farmers located in the area. The Toongtom subdistrict was excluded because farmers had little or no crop to sell in the past two years due to flooding. In the Tarwungproa subdistrict and the Banklaung subdistrict, permission had not been obtained from the subdistrict leaders. The subdistrict officials in charge of these areas could not be located for obtaining permission on the dates the researcher was in the area.

There were also mountainous or upland regions in the Sanpatong district that were not included in the interviewing process because the farmers in these areas belonged to different cultural groups, referred to as 'hill tribes'. Hill tribes spoke their own languages and had their own agricultural methods of farming. They usually either grew agricultural products for their own village consumption or sold the produce directly to the consumers in the city of Chiang Mai.

In the HangDong district, 35 people were interviewed from three different regions. These three regions were conveniently located while other regions in the HangDong district were missed for generally the same reasons as stated for in the Sanpatong district.

The interviewing process involved obtaining permission from the district offices in Sanpatong and HangDong, followed by getting permission from each subdistrict, and then by getting permission from each of the village heads in each subdistrict. After permission was obtained from the village head the interviews were selected randomly within each village. In the Banmae subdistrict for example, there were 13 townsites and approximately 14-24 people were interviewed in each townsite.

4.4 Review of the Sanpatong and HangDong Cooperatives[4]

The Sanpatong cooperative was established in the 1930s and had since expanded to 7,200 members in 1993. According to the manager of the Sanpatong cooperative, as of November, 1993 the cooperative was expanding by approximately 600 new members each year. The cooperative had 74 employees on the payroll. The cooperative marketed rice and soybeans and increased marketing activities to include garlic in 1993. The cooperative sold supplies such as fertilizer, chemicals, seed, gas, and equipment to any individual, member or nonmember. The cooperative also offered credit for inputs sold to members on arranged credit periods of one month, six months, and year. The interest rate charge was 11% but no gas was sold on credit. The cooperative offered cash credit to members up to the limit of 150,000 baht for up to three years. The interest rate charge was 11% for less than 60,000 baht and 12% for loans greater than 60,000 baht. The cooperative held land as collateral for loans and charged 3% surcharge for late payments. The cooperative obtained funds for lending from the Bank of Agriculture and Agricultural Cooperatives (BAAC) at 8% for less than 60,000 baht, and 9.25% for more than 60,000 baht. A 3% surcharge was applied on late payments.

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[4]Information comes from the manager of the Sanpatong Cooperative, interviewed on November 3th, 1993 and two managers of the HangDong cooperative interviewed on November 9th, 1993. The content of an interview with the onion cooperative is in Appendix F.

The cooperative purchased all produce from farmers at the plant site in Sanpatong and all transportation was the responsibility of each farmer. Any farmer could sell to the cooperative while membership was restricted to any individual obtaining income from farming in the Sanpatong district over the 20 years of age.

In 1993, rice prices varied from the low of 4.2 baht/kg to a high of 5.2 baht/kg. All farmers received the same price, however, differences in moisture content were adjusted according to the weight. The price was highest just before harvest and the price was lowest after harvest. The price of soybeans varied according to an unclassified grading system based on moisture content, crackage, and cleanliness or foreign matter in the crop. Good quality soybeans could get 8.5 baht/kg while poor quality soybeans could only get 6.5 baht/kg. Poor quality soybeans were generally too high in moisture content, had too many cracked seeds, and had a substantial amount of weed seeds or dirt in with the soybeans. The price of soybeans was the same for the entire year. Garlic prices on November 3, 1993 were 9 baht/kg for dry garlic of any size but the price went up and down throughout the year. According to the manager, farmers received cash for their produce the day of delivery except any delivery made on a weekend which would receive payment on the Monday.

Rice was processed at the plant by polishing it for shipment to Chiang Mai while soybeans and garlic required no further processing before shipment to either Bangkok or being sold directly to the consumers in the Sanpatong district. In 1993, the Sanpatong cooperative sold good quality polished rice in Chiang Mai for 9.6 baht/kg. The polishing costs for processing rice averaged 4.34 baht/kg. Medium quality unpolished rice sold in Chiang Mai received a price of 4.5 baht/kg and low quality unpolished rice received 4 baht/kg. Sticky rice was sold at 8 baht/kg after processing. Soybeans were classified at the plant and sold in three grades: A - 9.7 baht/kg; B - 9 baht/kg; C - 8 baht/kg for shipment to Bangkok. Soybean shipment costs to Bangkok were 0.3 baht/kg. Garlic had yet to be sold because it was the first year the cooperative had purchased the product.

The cooperative had storage facilities for storage up to six months. Farmers could store rice and soybeans at the plant site until there was a higher price provided that they paid a 2% charge of the selling price.

The manager stated that the Sanpatong cooperative provided training to its members by having group training in the village sites on fertilizer use, chemical use, and a chemical safety course. The cooperative also had training and advice on machinery use, repairs, and maintenance. The Sanpatong cooperative provided market information at the plant site on a pricing board and provided market information on request, such as what to grow and when to sell. The manager believed that most farmers generally understood the topics of discussion in group training, however, the manager did go on to mention that he felt that some farmers may not have enough basic education to understand simple discussions on chemical and fertilizer use, seed planting, etc...

According to the manager, the Sanpatong cooperative made five million baht profit in 1992. The profits from the cooperative were distributed to the farmers as dividends, used for capital purchases, for training programs, and as bonuses to good workers at the cooperative. Dividends were distributed to the farmers as 0.15 baht/kg for rice, 0.02 baht/kg for soybeans. Dividends were also given to people who lent cash to the cooperative for loan purposes, while 10% of profits were sent to the Cooperative League of Thailand to help other cooperative organizations become established.

The HangDong cooperative was established in 1971, and had expanded to 2,013 members by November 1993. According to the managers interviewed as of November 1993, the cooperative was expanding at the rate of about 100 new members in each year. The cooperative employed 11 people.

HangDong members were required to have lived in the HangDong district, be of honest standing, over 20 years of age, not have had credit from another organization to pay back, and had

never been rejected from another cooperative. Anyone could sell to the cooperative but only members could receive dividends.

The HangDong cooperative had purchased soybeans, rice, and garlic from the HangDong district for the past four years. Before the cooperative marketed produce, it was a credit cooperative. The cooperative also sold fertilizer, chemicals and seed and sometimes livestock feed. Credit was offered by the cooperative as cash credit and could be used for purchase of inputs from the cooperative. No credit was to be lent to farmers for the purposes of buying from another agent. The farmer could borrow up to a limit of 300,000 baht at 12.5% per year for up to five years. Credit arrangements were for 6 months at 10%, 1 year at 11.5%, 2 years, 3 years, and four years at 12.5% depending on the farmers needs. The credit arrangement for 6 months at 10% was for input purchases from the cooperative. The cooperative held land as collateral and there was a 3% surcharge for late payments. The cooperative borrowed money for the purposes of making loans at 6% from the Extension Department of the government and at 9.5% from the BAAC. The BAAC lent small sums of money to the farmer at no credit charge if the farmer had severe financial problems.

Rice and soybean products were differentiated for moisture content and cleanliness, and priced accordingly. There were however, no classified grades or weight adjustments for different moisture contents. Sticky rice was priced at a lower value. Garlic had the same price for all sizes and there was no procedure for grading.

The price of rice ranged between 3.5 and 4.2 baht/kg depending on quality and the time of the year. The price of soybeans ranged from 6.9 baht/kg to 9 baht/kg depending on the quality and time of the year. Garlic was 9 baht/kg at the date of the interview but varied during the year.

In 1993, the HangDong cooperative was selling all the products domestically to wholesalers in Chiang Mai and Sanpatong. The HangDong cooperative didn't process any of the products and cost for shipment to Chiang Mai or Sanpatong was 0.2 baht/kg. The cooperative sold rice at a price

range between 4.5 and 5.5 baht/kg, rice at a range between 8.5 and 9.5 baht/kg, and garlic at 10 baht/kg.

The HangDong cooperative had storage available at a cost of 0.2 baht/kg and the cost was deducted from the farmer's price when sold. Few farmers stored produce for later sale because the majority of farmers were short in cash.

The cooperative provided training in the villages and had a cooperative school for the daughters of the farmers. The cooperative also provided market information to new members on pricing and credit. However, the cooperative stated that the farmers may have wished for more training and market information than was provided. The managers also stated that some farmers could have obtained the training in the village from the wholesalers selling inputs.

According to the managers, the HangDong Cooperative made approximately three million baht in profits in 1992. The profits were distributed to the farmers, 10% to the Cooperative League of Thailand, for capital purchases, and to good workers as bonuses. The dividends were divided for distribution at 6% to lenders, and 2% to input buyers.

The Sanpatong and HangDong cooperatives are primary cooperatives under the umbrella of the Cooperative League of Thailand (CLT). They operate independently while following the same basic rules and regulations as outlined by the CLT. They cooperate with each other for some mutually beneficial activities such as cooperative employee training, etc...

The Sanpatong cooperative and the HangDong cooperative typify the successful cooperative enterprises in Thailand. The Sanpatong cooperative is the more established and larger of the two cooperative associations. The Sanpatong cooperative is generally considered a role model for other cooperative enterprises in Thailand.[5]

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[5] Verbally quoted by Dr. Dusit Jesdapidat and Dr. Boonrawd from the Maejo University.

4.5 The Questionnaire

The questions for the study were chosen to provide both a socioeconomic profile of the farm and farmer, and an analysis of their perceptions of the marketing agent(s), lending agent(s), and input supplier(s). The questionnaire progressed from general inquiries about the respondent's socioeconomic characteristics, to the details of the farming operation, to more specific questions about the marketing agent(s), credit lender(s), and the input supplier(s). The farmer's questionnaire consisted of open and closed ended questions to cross check the farmer's perceptions or opinions. The questionnaire substantiated open-ended questions by using a closed answer scale from 1 and 5, to query the importance and satisfaction the farmer perceived he/she received from the marketing/lending/inputs agent(s). For example, the importance and satisfaction of the farmer about the price received was substantiated by open-ended questions about the marketing agent, the price received, transportation costs, storage available and so on. Questions were sometimes asked within explicit directions or guidelines to coax an answer. This was considered to be essential to obtain more than vague answers.

4.6 The Data Collection

The data was obtained from a variety of farmers in the Northern Thailand districts of Sanpatong and HangDong by random interviewing in selected villages. The farmers from each of the villages were randomly selected and an effort was made to choose the farmers in an unbiased way. The sample consisted of some nonparticipatory farmers who had either consumed all their farm produce or had never sold their agriculture products in the past year(s). This was done to avoid any sample bias that could occur by having not included the farmers that weren't selling their farm products because none of the marketing agents were meeting the needs of all the farmers.

The study was completed with the help of seven students hired from Maejo University and an another student who acted as a language translator also from the Maejo University. The researcher and the language translator conducted some of the interviewing in the Sanpatong district and all of the interviewing in the HangDong district. Most of the interviewing in the Sanpatong district was carried out by the seven hired students who were responsible for scheduling and arranging the interviewing on their own. All interviews were done in the Thai language and those interviewed by the researcher were handled by the translator. The translator and the researcher communicated with one another without too much difficulty in the English language. The questionnaires were pretested in Ban Maejo by interviewing 9 different farmers, after which the questionnaire was modified to eliminate errors and inconsistencies. The students were briefed before going out to interview farmers and the questionnaires were translated by the researcher's translator. However, some problems were unavoidable. Translations and cultural differences were major obstacles in obtaining accurate, reliable information from the questionnaires. For example, some interviewers misunderstood how they were to ask some of the questions (i.e.grading); many farmers did not completely understand all of the questions; and some of the farmers' answers to the questions were either unclear or vague. Those questionnaires that were inconsistent in answers between the open questions and the closed scale of 1 to 5 were not included in the data analysis. Overall, despite the difficulties, it was the view of the researcher that the information collected generally reflected the opinions of the rural Thai farmers interviewed in the Sanpatong and HangDong districts.

V The Data

5.1 Socioeconomic Profile

5.1.1 Age

The characteristics on the variable age are broken down in Table 4 for the average age of farmers interviewed in the Sanpatong and the HangDong districts, members of the Sanpatong cooperative or the onion cooperative, active members of the HangDong cooperative, and farmers who sold to the wholesalers in Sanpatong and HangDong districts.

Table 4: Comparison of the Average Age

Variable	Mean for the Variable Age	Standard Deviation	Min Age	Max Age
Both Districts	47.68	12	21	78
Sanpatong District	47.99	12	21	78
HangDong District	44.29	8	30	63
Sanpatong Cooperative or Onion cooperative	48.12	11.83	N/A	N/A
Active Members of the HangDong Cooperative	39.44	6.87	N/A	N/A
Sell to the Wholesalers in Sanpatong	47.86	13.26	N/A	N/A
Sell to Wholesalers in HangDong	45.96	8.14	N/A	N/A

The villagers in both districts predominantly consisted of the elderly and young children. The vast majority of people between the ages of 20 to 40 worked in nearby factories or in the cities of Chiang Mai or Bangkok.

5.1.2 Gender

The gender of 270 of the 420 people interviewed in the Sanpatong and HangDong districts was male. In the Sanpatong district 63.1% of the people interviewed were male while 77.1% of the people interviewed in the HangDong district were male.

5.1.3 Education

The characteristics of the variable education are given in Table 5 in the four categories of no education, primary education, secondary education, and college education.

Table 5: Comparison of the Average Education

Variable	% No Education	% Primary Education	% Secondary Education	% College Education
Both Districts	5.7	89	4.8	0.5
Sanpatong District	6.25	88.8	4.4	0.5
HangDong District	0	91.5	8.5	0
Sanpatong Cooperative or Onion Cooperative	6.9	88	4.2	0.9
Active members of the HangDong Cooperative	0	77.8	22.2	0
Sell to the Wholesalers in Sanpatong	5.3	89.9	4.7	0
Sell to the Wholesalers in HangDong	0	96	4	0

Of those interviewed in Sanpatong and HangDong districts there were approximately 95% with primary education or less. Of those interviewed, 5.7% had no education (or just temple education), 89% had primary education, 4.8% had high school education and 0.5% had a college education.

5.1.4 Household Size

The average size of household for people interviewed from either the Sanpatong or HangDong districts were about four people. The average size of the household for an active member of the Sanpatong cooperative was 3.8 people and the average size of the household selling to a wholesaler or somewhere else was 3.9 people. There was no significant difference in household size between Sanpatong cooperative members and households selling to the wholesalers in the Sanpatong district.

5.1.5 Membership

Of the 385 farmers interviewed in the Sanpatong district 217 were members of either the Sanpatong cooperative or the onion cooperative. The number of farmers in Sanpatong district who sold rice to a market agent was 171; 87 farmers sold rice to the Sanpatong cooperative, 61 farmers sold rice to the wholesalers, 10 farmers sold rice to both the Sanpatong cooperative and the wholesalers, and 13 farmers sold rice somewhere else.

The number of farmers in the Sanpatong district who sold soybeans to a market agent was 324; 201 farmers sold soybeans to the Sanpatong cooperative, 102 farmers sold soybeans to the wholesalers, 12 farmers sold soybeans to both the Sanpatong cooperative and the wholesalers, and 9 farmers sold soybeans to somewhere else.

The number of farmers in the Sanpatong district who sold garlic to a market agent was 18; 1 farmer sold garlic to the Sanpatong cooperative in this the first year the Sanpatong cooperative has purchased garlic, 14 farmers sold garlic to the wholesalers, 2 farmers sold garlic to both the Sanpatong cooperative and the wholesalers, and 1 farmer sold garlic directly to consumers. The average number of years the cooperative farmer was a member of the Sanpatong cooperative was about 10 years.

There were 19 farmers who had been members of the Sanpatong cooperative one time or another but had since left the cooperative. The reason the farmers left the Sanpatong cooperative were either that they were rejected by the cooperative or there was no beneficial gain represented by being a member. The cooperative may have rejected the farmers membership because the farmer never repaid loans overextended or that the farmer was dishonest about other loans at other institutions.

There were 53 farmers who sold onions in the Sanpatong district and of these 37 were members of the onion cooperative in Sanpatong. Of the 53 farmers in the Sanpatong district who sold onions, 39 farmers sold to the onion cooperative and 14 sold to the wholesalers in the district. No onions were sold by the farmers interviewed in the HangDong district.

In the HangDong district, of the 35 farmers interviewed, 14 were members of the HangDong cooperative. The number of farmers in the HangDong district who sold rice to the HangDong cooperative was 6, the number who sold rice to the wholesalers was 26, and 3 farmers never sold any rice. The number of farmers in the HangDong district who sold soybeans to the HangDong cooperative was 7, the number who sold soybeans to the wholesalers was 12, and 16 farmers never sold soybeans. The number of farmers who sold garlic in the HangDong district to the HangDong cooperative was 2, one farmer sold garlic to the wholesalers, 2 farmers sold garlic to both the wholesalers and the HangDong cooperative, and 30 farmers never sold any garlic.

5.2 Economic Profile

5.2.1 Income

The characteristics on the variable income are broken down in Table 6 for the average annual income for citizens of Thailand, citizens living in the Chiang Mai region and farmers in the Sanpatong and HangDong districts.

Table 6: Comparison of the Average Income

Variable	Mean for the Variable in baht	#interviewed less than 20,000 baht	#interviewed 20-30,000 baht	#interviewed 30-40,000 baht	#interviewed 40-50,000 baht	#interview more than 50,000 baht
Thailand[6]	32,028	N/A	N/A	N/A	N/A	N/A
Chiang Mai Region in Thailand[6]	24,727	N/A	N/A	N/A	N/A	N/A
Sanpatong District	N/A	196	100	42	26	19
HangDong District	N/A	5	10	11	5	4
Sanpatong Cooperative or the Onion coop	N/A	96	60	28	18	13
Active members of the HangDong Cooperatives	N/A	0	2	3	4	0
Sell to the Wholesalers in Sanpatong	N/A	101	40	14	8	6
Sell to Wholesalers in HangDong	N/A	5	8	8	1	4

The response to questions on income levels for farmers interviewed in the Sanpatong district showed 51% with less than 20,000 baht income per a year, 26% with income between 20,000-30,000 baht per year, 11% with income between 30,000-40,000 baht per year, 7% with income between 40,000-50,000 baht per year, and 5% with income greater than 50,000 baht per year.

Of those farmers interviewed who sold to the Sanpatong cooperative 45% had income less than 20,000 baht per a year, 28% had income between 20,000-30,000 baht per year, 13% had income between 30,000-40,000 baht per year, 8% had income between 40,000-50,000 baht per year, and 6% had income greater than 50,000 baht per year.

[6]Thailand Statistical Yearbook, 1993

Of those farmers interviewed from the HangDong district 14% had income less than 20,000 baht per year, 29% had income between 20,000-30,000 baht per year, 31% had income between 30,000-40,000 baht per year, 14% had income between 40,000-50,000 baht per year, and 11% had income greater than 50,000 baht per year.

Of those farmers interviewed who sold to the HangDong cooperative no farmers had income less than 20,000 baht per a year, 22% had income between 20,000-30,000 baht per year, 33% had income between 30,000-40,000 baht per year, 44% had income between 40,000-50,000 baht per year, and no farmers had income greater than 50,000 baht per year.

Overall, the income levels for onion farmers interviewed in the Sanpatong district ranged from 37.7% of farmers with income less than 20,000 baht/year, 20.8% of farmers with income between 20,000-30,000 baht/year, 17% of farmers with income between 30,000-40,000 baht/year, 13.2% of farmers with income between 40,000-50,000 baht/year, and 11.3% of farmers with income greater than 50,000 baht per year. The income levels for onion farmers were higher than for those farmers whose staple products were rice or soybeans. Onions were well priced in the market because they were required to be grown on contract with the government and not everyone had access to the contracts.

5.2.2 Farm Size

The characteristics of the variable farm size are broken down in Table 7.

Table 7: The Average Farm Size for Households in Thailand

Variable	Mean for the Variable Farm Size (rai)	Standard Deviation
Sanpatong District	5.52	3.79
HangDong District	10.31	5.51
Sanpatong Cooperative or Onion Cooperative	5.59	3.67
Active members of the HangDong Cooperative	8.0	3.56
Sell to the Wholesalers in Sanpatong	5.42	3.93
Sell to the Wholesalers in HangDong	11.12	5.83

The average farm size for farmers interviewed from the Sanpatong district was 5.52 rai. The average land holdings for farmers interviewed from the HangDong district were 10.31 rai. The average farm size of members of the Sanpatong cooperative or the onion cooperative was 5.59 rai. The average farm size for farmers who were not members of a cooperative in the Sanpatong district was 5.42 rai. The average sized farm for members of a cooperative were slightly large than the average farm size of farmers who sold to the wholesalers. The farmers interviewed in the HangDong district were generally larger in farm size than those in the Sanpatong district.

5.2.3 Ownership

The percentage of land farmed that was owned by farmers interviewed in the Sanpatong and HangDong districts was 72%. The percentage of farm land owned by farmers interviewed in the Sanpatong district was 72%. The percentage of farm land owned by farmers interviewed in the HangDong district was 60%. The percentage of farm land owned by active Sanpatong cooperative members was 80% and the percentage of farm land owned by nonmembers who sold their agricultural produce to wholesalers in Sanpatong was 68.5%.

5.2.4 Crop Production

The area and the volume of production of rice, soybeans, garlic and onions on averaged over each farmer in the Sanpatong and HangDong districts are in Table 8.

Table 8: Past Year's Crop Area and Production

Variable	Rice (rai)	Rice (kgs)	Soybeans (rai)	Soybeans (kgs)	Garlic (rai)	Garlic (kgs)	Onion (kgs)	Onion (kgs)
Sanpatong District	4.88	2650	3.44	886	0.10	102	0.5	1482
HangDong District	9.56	6649	3.04	732	0.40	433	0	0
Active Members of a cooperative in Sanpatong district	4.98	2856	4.17	1039	0.03	37	0.53	1536
Active Members of the HangDong cooperative	6.89	4722	2.78	464	1.22	1667	0	0
Sell to the Wholesaler in Sanpatong	4.87	2475	3.17	767	0.15	95	0.18	636
Sell to a wholesaler in HangDong	10.48	7315	3.13	825	0.12	6	0	0

Of those farmers interviewed, the percentage of area each crop was grown on, to the total crop area grown on, in the Sanpatong district in the past year was 54.5%, 38.4%, 1.4%, and 5.7% for rice, soybeans, garlic, and onions, respectively. The percentages of area rice, soybeans, garlic, and onions were grown to the total crop area grown by active members of the Sanpatong cooperative in the past year were 51.2%, 43.0%, 0.3%, and 5.5%, respectively.

The average of production from those interviewed in the Sanpatong district consisted of the following: rice production of 2650 kg/year; soybean production of 886 kg/year; onion production of 1482 kg/year; and garlic production of 102 kg/year.

It can be seen in table 8 that the average volume of production and the average number of rai seeded in the Sanpatong district were generally higher for rice and soybeans by those farmers who were active members of the Sanpatong cooperative.

The percentages of area rice, soybeans, and garlic were grown to the total crop area grown in the HangDong district in the past year were 73.5%, 23.4%, and 3.1%, respectively.

The average production by each farmer from those interviewed in the HangDong district consisted of the following: rice production of 6649 kg/year; soybean production of 732 kg/year; garlic production of 433 kg/year and there was no onion production.

5.2.5 Crop Sales

The crop sales of rice, soybeans, garlic, and onions on average by each farmer in the Sanpatong and HangDong districts are given in table 9.

Table 9: Past Years Crop Sales

Variable	Rice (kgs)	Soybeans (kgs)	Garlic (kgs)	Onions (kgs)
Sanpatong district	886	840	99	1482
HangDong District	4086	732	433	0
Active members of a Cooperative in Sanpatong	1076	1035	34	1536
Active members of the HangDong Cooperative	2500	464	1667	0
Sell to the Wholesalers in Sanpatong	700	767	90	636
Sell to Wholesaler in HangDong	4634	825	6	0

In table 9, figures on crop sales from the farmers interviewed in the Sanpatong district would indicate that those farmers who are active cooperative members generally sold higher volumes of their agriculture produce on average than nonmember farmers who sold to

wholesalers. In the HangDong district, given the small sample, there is no clear indication of whether active members of the HangDong cooperative or nonmembers who sold to wholesalers sell larger volumes of agriculture produce.

5.3 Marketing Profile

5.3.1 Pricing

The price of unprocessed rice[7] in the Sanpatong and HangDong districts ranged from 2 baht per kilogram to 5 baht per kilogram. The average price paid for rice in the Sanpatong district was 3.57 baht/kg and 3.67 baht/kg in HangDong district. The average price paid by the Sanpatong cooperative to those individuals interviewed who sold rice to the cooperative was 3.7 baht per kilogram. The price of rice paid by the HangDong cooperative of those interviewed was 3.7 baht per kilogram. The price of rice paid by the wholesalers in Sanpatong district was 3.53 baht/kg. The average price paid by the wholesalers in the HangDong district was 3.67 baht/kg.

The price of soybeans in the Sanpatong and HangDong districts ranged from 4.5 baht per kilogram to 9.15 baht per kilogram. The price of soybeans paid in the Sanpatong district to those interviewed was 8.09 baht/kg and the average price paid by those interviewed in the HangDong district was 8.13 baht/kg. The average price paid by the Sanpatong cooperative to those individuals interviewed was 8.26 baht per kilogram. The price of soybeans paid by the HangDong cooperative to those interviewed was 8.07 baht/kg. The price of soybeans paid by the wholesalers in Sanpatong district was 8.07 baht per kilogram. The price of soybeans paid by the wholesalers in HangDong district was 8.16 baht/kg.

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[7] There are several different varieties of rice grown in Northern Thailand. Prices do vary depending on the rice variety grown. For example, sticky rice is priced at a value lower than other varieties of rice.

The price for garlic in the Sanpatong district ranged from 2 baht per kilogram to 14 baht per kilogram depending on the time of year and whether the garlic was dry garlic or not. The price paid by the Sanpatong cooperative to the one farmer interviewed who sold garlic to the Sanpatong cooperative was 7 baht per kilogram. The average price for garlic paid by the wholesalers in the Sanpatong district was 9.14 baht/kg. The price paid by the HangDong cooperative to the farmers interviewed was 9 baht/kg and the price paid by the wholesalers from the two farmers interviewed who sold to the wholesalers was 6 baht and 14 baht per kilogram.

The price for onions in the Sanpatong district ranged from 2 baht per kilogram to 7 baht per kilogram. The average price paid in the Sanpatong district was 3.02 baht/kg. The average price paid by the onion cooperative was 2.82 baht/kg and the average price paid by the wholesalers in the Sanpatong district for onions was 3.06 baht/kg. There were no onions sold by those interviewed in the HangDong district.

5.3.2 Services (Inputs Supply[8], Marketing Information[9], and Training)

The farmers in the Sanpatong and HangDong districts purchased input supplies such as chemicals, fertilizer, seed, and farm equipment from the cooperative organizations, wholesalers, businesses in the Chiang Mai market, and so on. Of the 299 questionnaires providing enough information on input supplies from the Sanpatong district, 170 farmers or 57% interviewed indicated that they purchased their input supplies from the cooperatives, 44 farmers or 15% purchased from the wholesalers, 3 farmers or 1% purchased from both cooperatives and wholesalers, 44 farmers or 15% purchased from another source[10], and 38 farmers or 12.7% never purchased input supplies. From the HangDong district, 11 farmers purchased their input supplies from the cooperative, 3 farmers

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[8]The government agency, Marketing Organization for Farmers (MOF), subsidizes fertilizer for the purposes of distributing to small rural farmers through farmer associations such as cooperatives. The subsidy program had been set up to encourage farmers to apply optimal amounts of fertilizer by reducing the price of fertilizer per metric tonne and by subsidizing internal transportation from the warehouse in Bangkok to the farm gate. The price of subsidized fertilizer being fixed for all parts of the country.

In 1985/86 year, on average 74.3 kg of fertilizer was distributed to each rice farmer in Thailand. It was calculated that the average farmer required 180 kg of fertilizer each year and therefore the government subsidized 41.27% of farmers' fertilizer requirements (Suthakarn, Proceeding from Seminar, 1988:34).

[9] In an article by Kaosa-ard, M., Rerkasem, K., and C. Roongruangsee (1989), "Agricultural Information and Technological Change in Northern Thailand", the researchers reported the different external sources of information used by farmers in rural villages. The following are some general conclusions the researchers made.

Farmers who belong to an economic group such as the BAAC, a cooperative, or a crop-specific group tend to have more opportunities to interact with technology transfer agents and receive technology supplied by the organizers of the group.

Television has become more popular than radio as means of diffusing information in Northern Thailand. For example, television is a source of agriculture practices, new crop varieties, chemicals, seed, and a minor source of information on prices.

Extension officiers are an important source of knowledge regarding chemical input, farm techniques, new crop varieties, and other technologies.

Extension officiers and television were cited as the most frequent source of information.

The contact farmers follow the same pattern as that of the extension officiers but may not be quite so important to the farmers as a information source.

Local traders are a major source of pricing information and agrochemical firms are a good source of information on chemical inputs and to a minor extent, also a source of information on the different kinds of chemical inputs.

[10] Other sources of input supply are the BAAC, input supply wholesalers, the government, and from the market in Chiang Mai.

purchased from the wholesalers, 3 farmers purchased from both the cooperative and the wholesalers, 17 farmers from another source such as the BAAC, and 1 farmer never purchased input supplies.

In the Sanpatong district 45% of the farmers indicated that they obtained marketing information from the Sanpatong cooperative, 12% got marketing information from the wholesalers, 6% got marketing information from the Sanpatong cooperative and the wholesalers, and 38% stated that they never got marketing information from any marketing agents. While 40% of farmers indicated that they received training from the Sanpatong cooperative, 6% received training from the wholesalers, 3% received training from the Sanpatong cooperative and the wholesalers, and 51% never got training from any of the market agents.

In the Sanpatong district, farmers gave the following as other sources of agriculture information: 44.4% used contact farmers[11], 4.4% got information from other farmers, 62.6% had general knowledge from their village, 14% got information from the television, 10.4% got information from the radio, 3.4% got information through the newspapers, and 9.4% said they never got information from any other sources. Overall, 44% of farmers stated that they were satisfied with the market information and training they received, 7% were somewhat satisfied with the market information and training received, and 49% were not satisfied with the market information or training they received.

In the HangDong district, out of the 35 farmers interviewed, 16 indicated that they obtained marketing information from the HangDong cooperative, 3 got marketing information from the wholesalers, and 16 stated that they never got marketing information from any of the marketing agents. While 7 farmers indicated that they received training from the HangDong cooperative, 3 received training from the wholesalers, and 25 never got training from any of the of the marketing

[11]Contact farmers are farmers that have been paid by the government of Thailand to help advise other farmers how they may improve their farming methods.

agents. Overall, 20 farmers stated that they were satisfied with the market information and training they received, 1 farmer was somewhat satisfied with the market information and training received, and 13 farmers were not satisfied with the market information or training they received.

5.3.3 Convenience (Timing of Purchase, Location, and Transportation)

The agricultural products produced by the farmers in Northern Thailand could be sold after harvest, or stored by the farmer or the marketing agent. The tropical weather conditions in Thailand however meant products like soybeans could only be stored for a short period without a reduction in market value of the product. Many rice farmers stored their rice produce for their own household consumption. Of 415 farmers interviewed from Sanpatong and HangDong who provided full information, 103 farmers or 25% indicated that they sold rice shortly after harvest. 9 farmers or 2% sold when they needed money, 63 farmers or 15% waited until the highest price, 26 farmers or 6% stored their produce with no reason given, and 214 farmers or 52% never sold rice. Other products such as soybeans, garlic and onions were usually sold immediately after harvest. Of 416 farmers interviewed from Sanpatong and HangDong who provided information, 347 farmers or 83.4% indicated that they sold their other products immediately after harvest, 10 farmers or 2.4% waited to sell their produce at the highest price, 11 farmers or 2.6% stored their produce with no reason given, and 48 farmers or 11.5% never sold soybeans, garlic, or onions. Although the option of storing produce, at a charge, was available for cooperative members no farmers indicated that they stored their produce at a cooperative to wait until the price of their produce improved.

All purchases by the cooperatives were made at the plant sites in Sanpatong and HangDong. Transportation was the responsibility of the farmer. Many of the wholesalers provided transportation of the agriculture produce because they were either based in the village of the farmers or they were willing to go to the farmers village to get the agricultural product. Many farmers expressed

transportation as an important reason why they sold their agricultural produce to the wholesalers rather than the cooperatives. Transportation costs from the farmer's village to the towns of either Sanpatong or HangDong ranged from 0.1 baht per kilogram to 0.3 baht per kilogram. Those farmers who had their own means of transportation likely paid less than 0.1 baht/kg in costs for gas, etc..., to transport to the townsite.

5.3.4 Grading

The Sanpatong cooperative and HangDong cooperative informally graded agriculture products according to standards of moisture content, cleanliness, foreign material, cracking, etc.. The Sanpatong cooperative did not use a classified grading system for pricing the farmer's produce but adjusted the payment to the producers by lowering the weight of the product. The HangDong cooperative subjectively priced the product to match the perceived value the cooperative personnel considered the product to be worth. The wholesalers had sometimes graded according to moisture content, cleanliness, foreign material, etc.. but according to the farmers interviewed many wholesalers were using no grading method at all. Of the 159 questionnaires from farmers who sold rice in the Sanpatong district and provided information on grading rice, 92 farmers or 58% were satisfied with the grading performed, 20 farmers or 13% were not satisfied with the grading that was performed, 36 farmers or 23% were somewhat satisfied with the grading, and 11 farmers or 7% stated that they were unsure because they didn't understand grading. Of the farmers who were members of a cooperative in the Sanpatong district, 62% indicated that they were satisfied with grading done on rice while 51% of the farmers who were not members of a coop indicated that they were satisfied with the grading done on rice.

Of the 319 questionnaires from farmers who sold soybeans and provided information on grading soybeans in the Sanpatong district, 198 farmers or 62% were satisfied with the grading

performed, 31 farmers or 10% were not satisfied with the grading that was performed. 73 farmers or 23% were somewhat satisfied with the grading, and 17 farmers or 5% stated that they were unsure because they didn't understand grading. Of the farmers who were members of a cooperative in the Sanpatong district, 65% indicated that they were satisfied with grading done on soybeans while 58% of the farmers who were not members of a coop indicated that they were satisfied with the grading done on soybeans.

In the HangDong district, of 29 farmers who sold rice and provided information on grading rice, 19 were satisfied with the grading performed on rice. Of the 16 farmers who sold soybeans and provided information on grading soybeans, 10 were satisfied with the grading performed on soybeans.

5.3.5 Dividends

The Sanpatong and HangDong cooperatives in the past year distributed a share of their profits back to their farmers as dividends while wholesalers kept any profit for their own. The average sum of money returned to the farmer as dividends for the 1992 crop year as indicated by the farmers who sold to the cooperative and were members of a cooperative in Sanpatong was 308 baht. In terms of dividends as as percentage of average total gross revenue per year it is approximately 1%. The average sum paid in the past year to the members interviewed from the HangDong cooperative was 1041 baht. The largest amount issued as dividends to a farmer interviewed in either district was 4000 baht.

5.3.6 Trust

The 1 to 5 scale rating on the closed portion of the questionaire and the answers from the open-ended questions indicate that trust is an important issue for many farmers. Some farmers show a sense of distrust with the marketing/lending/input supply agent(s) whom they deal with.

The trust issue as it pertains to the situation in Northern Thailand may be best expressed by the indirect words from Vernon Ruttan (1969) and as a direct quote from Rufus Hughes et al.(1968) in the statement that "individual feelings of obligation are particularistic in nature and tend to be limited to persons with whom the individual stands in some personal kinship or friendship relation: they did not extent to fellow members of a cooperative or to the shareholders of a corporation which the individual serves as an elected officer, an employee, or a government supervisor".

The farmers responses on the issue of trust indicated that their distrust of the cooperative or wholesaler was due in part to the following reasons: the grading did not reflect the value of the product; the agent never explained how the price for the product was obtained; the agent never allowed the farmer to see the weight of the product during the weighing; price was much too low; the agent did not deal in honest faith; and the dividends issued did not reflect the true profit of the organization.

5.4 Credit Profile

5.4.1 Credit Available[12]

Farmers borrowed from several different sources in the Sanpatong and HangDong districts. For example, they borrowed on short-term credit from the Sanpatong cooperative, the HangDong cooperative, the onion cooperative, the wholesalers, the BAAC, the banks, and/or from friends. Farmers borrowed anywhere up to 50,000 baht from the creditors. The loan was borrowed anywhere from one month to one year. The short term loan was usually for the purposes of buying inputs for the crop year to pay back after the farmer sold his/her produce after harvest. In the Sanpatong district, 63% of farmers indicated that they had used short-term credit to purchase their input supplies. In the HangDong district, 56% of farmers indicated that they had used short-term credit to purchase their input supplies.

Long-term credit was extended by the Sanpatong cooperative, the HangDong cooperative, the BAAC, the banks, and or friends and usually required collateral. Many farmers did not or could not obtain long term credit. Those farmers that did, borrowed from anywhere between one year and five years (for cooperatives 3 years). Farmers borrowed anywhere up to 150,000 baht. In the

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[12] A national credit survey of farmers in 1962/63 reported in an article by T. Onchan in the 1984 APO report, showed that about 90 percent of farm credit was supplied by informal lenders such as merchants, friends, relatives, etc. While in the 1984 APO report by T. Onchan, it was estimated that about 60 percent of the total farm credit came from institutional sources such as credit cooperatives, BAAC, and commercial banks (Onchan, APO, 1984/63). A study done in Northeastern Thailand in 1982/83 showed that 44, 52 and 74% of farmers received credit from BAAC, other lending institutions, and independent sources respectively (Boonma, Proceedings from Seminar, 1988/38).

The national credit survey in 1962/63, showed that 49 percent of total agricultural credit was used for production. Much of this involved loans for operating expenses such as labour costs, seed purchases, animal feeds, and fertilizer costs. The remaining 51 percent of the credit was used for consumption expenses, such as living costs. In 1974/75 a study showed that production loans accounted for 73 percent of the total credit (Onchan, APO, 1984/60). In 1980/81 in the Chiang Mai area 70.6 percent of credit use was for production. The 1974 study also showed that small-sized farmers used about 66 percent of their borrowed money for production, while medium-sized farmers used 78 percent for production and large-sized farmers used 80 percent for production (APO, 1984/60-62).

Sanpatong district, 37% farmers indicated that they had intermediate or long term loans. In the HangDong district, 24 farmers that they had intermediate or long term loans.

5.4.2 Credit Charge[13]

The interest on loans borrowed from the Sanpatong cooperative, the BAAC, the wholesalers, or the banks as stated by the farmers interviewed, usually ranged from 11% for one year to 13% for more than one year. The interest rate for short-term credit from the Sanpatong cooperative was 11% and the interest rate from the BAAC, the banks, and wholesalers were in the same range. The rate from other informal lenders was unknown. The credit charge on intermediate and long-term loans from the Sanpatong cooperative was 12.5% and the interest rate charged by the BAAC and the banks ranged between 12 to 13%.

[13]In 1989, commercial banks were required to loan to agriculture at least 9% of the value of all loans outstanding, either directly or indirectly by making deposits with the BAAC (Boonma, Proceedings from Seminar, 1988:37). The BAAC then lent to farmers' cooperatives at 9%, and the cooperatives lent to the farmer at 12.5%. Non-institutional credit was anywhere from 25% to 100%, depending on the size of the farm, its location, and the type of crops grown (Boonma, Proceedings from Seminar, 1988:42).

VI Model Specification, Estimation, and Results

6.1 Model Specification

The models were set up using attributes deemed to be important from previous research studies on cooperative organizations and the circumstances in Northern Thailand. The attributes specified as important for using in the models were price, inputs supply, credit made available, credit interest rate, location, time of purchase, grading of the product, storage provided, training and market information, trust of the agent, and dividends. Each of these attributes were modeled to determine if the attribute was important to the farmer and whether or not the same farmer was satisfied with the provided attribute. The theoretical background on cooperatives and the previous studies on cooperatives in Thailand provide an interesting backdrop for a hypothesis of how cooperatives may fair in comparison to the wholesalers. For example, from a theoretical point of view the cooperative organizations may be expected to provide improved performance from the farmers' perspective on all these attributes defined above. However, the mixed performance results reported in studies of cooperatives in Thailand as discussed in a previous chapter suggests that there may, in fact, not be an improvement in the market place from the farmers' perspective.

The farmers perceptions of the Sanpatong and HangDong cooperatives, and the wholesalers from each of the respective districts in Northern Thailand were analyzed by collecting discrete data on characteristics or attributes perceived relevant to these market organizations. The nature of the data was discrete for the explicit purposes of trying to determine what characteristics about the market agents are important and how satisfied the farmers are with respect to their market agent(s) in context to the market agent characteristics. The analysis from the perspective of the farmers was done using discrete analysis for the following reasons: there are several characteristics of the market organizations that cannot be expressed using quantitative values observed in the market such as the input satisfaction, market satisfaction and so on; and collecting quantitative data that reflects each of

the characteristics would have been extremely difficult given time limitations, language and cultural constraints, and the lack of available data.

Discrete data may be analyzed using a regression such as a linear probability model. However, the obvious drawback to this method is that values of the dependent variable between 0 and 1 may lie outside the 0-1 range because of the linear nature of the model. There are two popular methods to limit the the estimated probabilities to the 0-1 interval, the probit model and the logit model. The difference between the two methods is that the probit model based on cumulative normal distribution and the logit model based on logistic distribution. The logit technique is used in the estimation models below because the two distributions are very similar and the logit model requires less computational costs. The logit technique is used in the context of the random utility model as defined in the next section.

6.2 Methodology

The Random Utility Model (RUM) or the discrete choice model was initially developed by McFadden (1973) in the field of transportation and further augmented by Maddala (1989), Ben-Akiva and Lerman (1993) and others in different applications. In this chapter some of the underlining concepts from the RUM are used to measure and compare the utility of different organizations as perceived by the decision-maker in the context of a set of attributes associated with each organization.

In the Random Utility framework, the decision-maker is faced with a discrete choice set of mutually exclusive alternative organizations denoted by C_n. Each choice, i, in the set has associated with it a conditional indirect utility defined as a function of the attributes of the alternative organizations, Q, and the socioeconomic characteristics of the decision maker, S, as in:

$$U = (Q_{in}, S_n)$$

where Q_{in} is a vector of the attribute values for alternative i as viewed by the decision-maker n and S_n is a vector of characteristics of the decision maker n.

The choice process involves the decision maker choosing one organization over another because the utility associated with that organization is higher than for any other organization.

$U_{in} > U_{jn}$, where i, j are elements of C_n.

The underlying indirect utility function U_j, is composed of a systematic or deterministic component, V_j, and a random component, e_i. The random component accounts for incomplete information, unexplained changes in the decision-makers perceptions, and research error.

Therefore in a statistical context, the probability that a decision-maker will choose organization i is:

$$P(i) = P(U_i > U_j)$$
$$= P(V_i + e_i > V_j + e_j)$$
$$= P(V_i - V_j > e_j - e_i = e_n)$$

The assumption that e_n is logistically distributed is equivalent to assuming that e_{in} and e_{ij} are independent and identically Gumball or that the e's are type I extreme value distributed (the null hypothesis is rejected when this is actually true). Under the assumption that e_n is logistically distributed (S-shaped) the probability of alternative i can be denoted as:

$$Pr(i) = \frac{e^{V_{in}}}{\sum e^{V_{in}}}$$

where the denominator is the sum of the exponential of the conditional indirect utilities over all the alternatives in the choice set.

Choice of the functional form for deriving the systematic component of the utility function involves consideration of a functional form with convenient computational properties and one that is based on a prior knowledge about how selected variables will affect utility. Most researchers have selected linear utility functions of the form

$$V_{in} = B_1X_{in1} + B_2X_{in2} + B_kX_{ink}$$

where X_{ink} are either measures of alternative attributes, Q_{in}, or socioeconomic characteristics, S_n, and the Bs are unknown parameters.[14]

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[14]Linearity applies to the parameters and is not equivalent to linearity in the attributes Q and S.

The models are estimated using Maximum Likelihood techniques. Ben-Akiva and Lerman outlined the likelihood function in the following form:

$$L^* = \prod_n \prod_i P_n(i)^{Y_{in}}$$

where Y_{in} = { 1 if the individual n chose i, 0 otherwise }

When the form is linear in parameters then:

$$P_n(i) = \frac{e^{B'X_{in}}}{\sum e^{B'X_{jn}}}$$

The maximum likelihood estimation technique finds the vector B such that the logarithm of L* is maximized. Ben-Akiva and Lerman attribute McFadden (1974) as showing that ln(L*) is concave, so that a unique maximum potentially exists. Using the maximum likelihood estimation yields an estimate of B that is consistent, asymptotically normal, and asymptotically efficient.

One of the properties of the logit form is the following:

$$\sum Y_{in} = \sum P_n(i)$$

The maximum likelihood estimate of B of the logit form is useful in that theoretically it implies that the predicted share choosing alternative i will equal the number of people actually choosing it or the sum of all the choice probabilities for alternative i (summed over all individuals in the sample) equals the actual number in the sample that chose i (Ben-Akiva and Lerman).

6.3 Estimation Techniques

6.3.1 Binomial Logit Models

The probability that a farmer will choose one of two marketing alternatives, cooperative or private wholesaler, can be estimated using a binary logit model. In the binary logit model the coefficients indicate the effect a change in the independent variable has on the probability that the dependent variable equals 1. For example, a 1 can indicate that the farmer has chosen to sell to the cooperative while a 0 indicates the farmer sold somewhere else (ie.private wholesaler). The sign of

the coefficient indicates the direction of the effect. In the binomial model analysis a variety of dummy variables are used to represent answers to questions on a five-point rating scale to imply attribute values for the alternative organizations, cooperative or private wholesaler. All these questions follow a format either of which 5 indicates a response of "very important" or "very satisfied" and 1 reflects a "very unimportant" or "very unsatisfied" response. Each category except 1 and maybe 2, "(very) unimportant" or "(very) unsatisfied" are represented by a dummy variable that equals 1 if the individual chose it and 0 otherwise. The categories "(very) unimportant" or "(very) unsatisfied" are used as base cases and are captured in the intercept terms. It is hypothesized that positive coefficients on the dummy variables correlate with the probability of selling to the cooperative, relative to the probability if "very unimportant" or "very unsatisfied" were chosen. Negative coefficients indicate that, relative to the probability when "very unimportant" or "very unsatisfied" were chosen, selection of the category reduces the probability of selling to the cooperative. In other words, positive coefficients indicate that the probability of selling to the cooperative increases for those farmers who place greater importance on the variable and indicate more satisfaction from their organization.

The choices relate to the perceived importance and satisfaction of the following variables for the alternative organizations: price, inputs available, credit available, credit charge, convenience of location, time of purchase, storage available, grading practices, market information available, training available, trust of the organization, and dividends. The variables and a description of each are given later in the context of Table 10 and Table 11.

Socioeconomic and individual characteristics are also incorporated as independent variables in the analysis of the alternative organizations. For example the binary logit model of choice between the cooperative and the private wholesaler may include variables for cooperative membership, sex, age, family size, education, income, farm size, owned or rented land, crop type, crop production, and

farm location. The variables and a description of each are given later in the context of Table 10 and 11.

6.2.2 Ordered Probit and Censored Tobit Models

The ordered probit model is based on the following specifications:

$z=B'x + e,\ e \sim N[0,1]$
$y = 0$ if $z \leq m_0$,
1 if $m_0 < z \leq m_1$,
2 if $m_1 < z \leq m_2$,
.....
J if $z > m_{J-1}$

This model takes into account the extra information implicit in the ordinal nature of the dependent variable. Estimation is done using maximum likelihood estimation.

The tobit model is defined as following:

$y_i = B'x_i + u_i$ if RHS > 0
$y_i = 0$ otherwise

where u_i are residuals that are independent and normally distributed.

The tobit model contains elements of a regression and elements of a probit model. The model is estimated by assuming a model such that the desired dependent variable was observed whenever it exceeded some constant minimum level.

6.2.3 Multinonimial Logit Models

In the multinomial logit model, we may obtain further insight by expanding the choice set of the decision-maker by including other choices. The two approaches taken in this study are to expand from the original binomial model by including those farmers who sold part of their produce to both the wholesalers and the cooperative, and a nonparticipatory variable for farmers who did not sell in the past year. The theory on the multinomial logit model is unchanged from the binomial with the exception that the comparison is made between all alternatives rather than just two.

6.3 Analysis of the Modeling

A descriptive analysis of the variables that data were obtained on in the interviewing process from the Sanpatong and HangDong districts are in Tables 10 and 11. The variables are further expressed in the context of the farmers' choices in Table 12. In Table 12, a cross tabulation of each of the farmer's choices from the closed rankings between 1 and 5 for each of the variables for the particular agent are shown. The table is divided into an analysis of the data from the Sanpatong district and for the HangDong district using absolute values given by the farmers. The table also includes the calculated percentage values for the wholesalers and the cooperative in the Sanpatong district for each of the variable's rankings from 1 to 5. Moreover, the table incorporates a sub-table of the managers' rankings for each of the variables from the manager's viewpoint.

In Table 13, 3 binomial and 4 multinomial logit models are introduced.[15] In each of the three binomial models, 1 isa choice of Sanpatong cooperative and 0 is a choice of wholesaler.[16] Three hundred and six questionnaires were utilized in the binomial models. Of these, 185 were from farmers who chose the Sanpatong cooperative and 121 were from farmers who chose a wholesaler. The questionnaires where the respondent chose both the cooperative and a wholesaler were not included. Each of the binomial models included some combination from the following variables: a constant, INPUTSAT, CASAT, CAIM, CCSAT, CCIM, LOCSAT, TIMESAT, STIM, GRADIM,

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[15]Regressions using all the variables as outlined in Tables 10 and 11 are encompassed in Appendix C and D. Included in Appendix C are 10 binomial models and included in Appendix D are 4 multinomial models.

[16]The rules used for defining the agent choice when the farmer sells more than one agriculture product and/or sells to more than one agent were as follows:

(1) If the farmer sells rice, soybeans, and/orgarlic to a single agent that agent is defined as the farmer's choice.
(2) If the farmer sells rice, soybeans, and/or garlic to more than one agent the agent choice is defined as both.
(3) If the farmer sells onions and at least one other crop (rice, soybeans, or garlic), the agent is defined as the farmer's choice for either rice, soybeans, or garlic.
(4) If the agent choice was not clearly defined the data was excluded from the analysis.

MISAT, TRAINSAT, TRAINIM, TRUSTSAT, DIVSAT, DIVIM, COOPMEM, INCOME, SUBDIST, FARMSIZE, SOYSOLD, GARLICSOLD, LONGAG, PEROWNED, VILLAGE, FAMILY, and MKAGENT. In each of the four multinomial models, 1 is a choice of Sanpatong cooperative, 0 is a choice of wholesaler, and 2 is a choice of both the Sanpatong cooperative and the wholesaler. Three hundred and forty-six questionnaires were utilized in the multinomial models. Of these, 185 were from farmers who chose the Sanpatong cooperative, 121 were from farmers who chose a wholesaler and 40 were from farmers who chose both the Sanpatong cooperative and a wholesaler. Each of the multinomial models included some combination from the following variables: a constant, PRICESAT, INPUTSAT, CASAT, CAIM, CCSAT, CCIM, LOCSAT, TIMESAT, STIM, MISAT, TRAINSAT, TRUSTSAT, DIVSAT, DIVIM, COOPMEM, INCOME, SUBDIST, SOYSOLD, GARLICSOLD, LONGAG, PEROWNED, VILLAGE, FAMILY, and MKAGENT.

In Table 14, ordered probit models and censored tobit models are introduced to analyze each of the attributes as a dependent variable with AGENT or COOPMEM among other variables as the independent variables. This approach is taken as a alternative way of interpreting the attributes and it may also overcome some of the problems associated with the logit model as will be discussed later.

In Table 15, six models are introduced to analyze particular aspects prevalent to the study. Model 1 from Table 15 is the marginal probabilities for the same variables analyzed in the multinomial choice model number 5 from Table 13. The marginal probabilities are given because they are useful in clarification of the results pertaining to the the different choices. Marginal probabilities examine the change in the probability of choosing the choice set variable (0, 1, or 2) for a given change in the attribute rating. For example, a positive and significant marginal probability for a chosen rating of 5 (very important) for variable X with respect to the cooperative choice indicates that the farmer values importance significantly in connection with the cooperative choice

in relation to the other choices in the set. In model 2, Table 15, the choice set is expanded to include for nonparticipation to find out how the the perceptions of those farmers who never sold their agricultural produce may differ from those farmers who did sell an agricultural product to a marketing agent. In models 3 and 4, Table 15, the HangDong district is included in the analysis and a dummy variable is added to take into account any differences in the choice set between the two districts, Sanpatong and HangDong. In models 5 and 6, in Table 15, the farmers who sold exclusively to the onion cooperative are included in the model and a dummy variable is added to account for the significance of onion products in the choice between either a cooperative organization (Sanpatong cooperative or the Banuk 'onion' cooperative) and the wholesalers.

Table 10: Descriptive Statistics of Variables Obtained from the Interviewing Process in Sanpatong District

	Number of Respondents Who Answered In Each Category						Summary Statistics			
Variable	0	1	2	3	4	5	Mean	ST	Min	Max
AGENT[a]	121	185	40	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AGENTRICE[b]	61	100	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AGENTSOY[c]	201	111	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AGENTON[d]	13	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PRICEIM[e]	N/A	0	1	8	42	334	N/A	N/A	N/A	N/A
PRICESAT[f]	N/A	12	87	121	141	24	N/A	N/A	N/A	N/A
INPUTIM[g]	N/A	2	6	32	225	120	N/A	N/A	N/A	N/A
INPUTSAT[h]	N/A	9	74	134	143	25	N/A	N/A	N/A	N/A
CAIM[i]	N/A	11	20	126	127	101	N/A	N/A	N/A	N/A
CASAT[j]	N/A	52	48	147	100	38	N/A	N/A	N/A	N/A
CCIM[k]	N/A	9	21	148	113	93	N/A	N/A	N/A	N/A
CCSAT[l]	N/A	60	65	160	82	18	N/A	N/A	N/A	N/A
LOCATIONIM[m]	N/A	0	9	62	212	102	N/A	N/A	N/A	N/A
LOCATIONSAT[n]	N/A	8	51	147	153	26	N/A	N/A	N/A	N/A
TIMEIM[o]	N/A	1	9	70	172	133	N/A	N/A	N/A	N/A
TIMESAT[p]	N/A	10	45	105	151	74	N/A	N/A	N/A	N/A
STORAGEIM[q]	N/A	5	16	82	120	162	N/A	N/A	N/A	N/A
STORAGESAT[r]	N/A	9	30	122	123	101	N/A	N/A	N/A	N/A
GRADINGIM[s]	N/A	9	33	167	142	34	N/A	N/A	N/A	N/A
GRADINGSAT[t]	N/A	23	64	201	84	11	N/A	N/A	N/A	N/A
MIIM[u]	N/A	1	3	73	206	102	N/A	N/A	N/A	N/A
MISAT[v]	N/A	29	91	160	91	14	N/A	N/A	N/A	N/A
TRAININGIM[w]	N/A	2	8	74	187	114	N/A	N/A	N/A	N/A
TRAININGSAT[x]	N/A	60	110	105	98	12	N/A	N/A	N/A	N/A
TRUSTIM[y]	N/A	6	15	92	187	85	N/A	N/A	N/A	N/A
TRUSTSAT[z]	N/A	20	52	144	129	40	N/A	N/A	N/A	N/A

DIVIM[aa]	N/A	13	30	106	145	89	N/A	N/A	N/A	N/A
DIVSAT[bb]	N/A	76	60	137	85	24	N/A	N/A	N/A	N/A
SEX[cc]	243	142	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AGE[dd]	N/A	N/A	N/A	N/A	N/A	N/A	47.99	N/A	21	78
FAMILY[ee]	N/A	N/A	N/A	N/A	N/A	N/A	3.84	N/A	1	9
EDUCATION[ff]	24	341	17	2	N/A	N/A	N/A	N/A	N/A	N/A
INCOME[gg]	196	100	42	26	19	N/A	N/A	N/A	N/A	N/A
FARMSIZE[hh]	N/A	N/A	N/A	N/A	N/A	N/A	5.52	3.79	1	28
OWNED/RENT[ii]	51	333	N/A	N/A	N/A	N/A	4.11	N/A	N/A	N/A
CROP[jj]	171	324	18	52	N/A	N/A	N/A	N/A	N/A	N/A
MARKETAGENT[kk]	N/A	21	47	112	170	35	N/A	N/A	N/A	N/A
WHENSOLD[ll]	211	24	84	8	53	5	N/A	N/A	N/A	N/A
WHENSOLD	32	9	330	0	10	4	N/A	N/A	N/A	N/A
MEMBER[mm]	168	217	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LONGAG[nn]	18	8	99	203	27	10	10.6	N/A	N/A	N/A
POOLMON[oo]	N/A	1	2	19	124	238	N/A	N/A	N/A	N/A
POOLLAB[pp]	N/A	2	4	23	96	259	N/A	N/A	N/A	N/A
VILLAGE[qq]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SUBDISTRICT[rr]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 11: Descriptive Statistics of Variables Obtained from the Interviewing Process in Hangdong District

	Number of Respondents Who Answered In Each Category						Summary Statistics			
Variable	0	1	2	3	4	5	Mean	St.	Min	ma
AGENT[a]	25	9		N/A	N/A	N/A	N/A	N/A	N/A	N/A
AGENTRICE[b]	26	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AGENTSOY[c]	12	7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PRICEIM[e]	N/A	0	0	0	24	11	N/A	N/A	N/A	N/A
PRICESAT[f]	N/A	1	19	7	7	1	N/A	N/A	N/A	N/A
INPUTIM[g]	N/A	0	0	3	29	3	N/A	N/A	N/A	N/A
INPUTSAT[h]	N/A	0	8	8	18	1	N/A	N/A	N/A	N/A
CAIM[i]	N/A	1	2	7	24	1	N/A	N/A	N/A	N/A
CASAT[j]	N/A	0	4	10	20	1	N/A	N/A	N/A	N/A
CCIM[k]	N/A	0	0	2	33	0	N/A	N/A	N/A	N/A
CCSAT[l]	N/A	0	9	16	7	3	N/A	N/A	N/A	N/A
LOCATIONIM[m]	N/A	1	1	3	29	1	N/A	N/A	N/A	N/A
LOCATIONSAT[n]	N/A	1	5	5	21	3	N/A	N/A	N/A	N/A
TIMEIM[o]	N/A	0	2	7	25	1	N/A	N/A	N/A	N/A
TIMESAT[p]	N/A	2	5	8	20	0	N/A	N/A	N/A	N/A
STORAGEIM[q]	N/A	3	4	6	21	1	N/A	N/A	N/A	N/A
STORAGESAT[r]	N/A	2	2	10	19	2	N/A	N/A	N/A	N/A
GRADINGIM[s]	N/A	8	10	6	10	1	N/A	N/A	N/A	N/A
GRADINGSAT[t]	N/A	0	7	7	19	2	N/A	N/A	N/A	N/A
MIIM[u]	N/A	0	0	6	26	3	N/A	N/A	N/A	N/A
MISAT[v]	N/A	1	9	10	14	1	N/A	N/A	N/A	N/A
TRAININGIM[w]	N/A	0	0	3	31	1	N/A	N/A	N/A	N/A
TRAININGSAT[x]	N/A	0	7	9	18	1	N/A	N/A	N/A	N/A
TRUSTIM[y]	N/A	0	0	3	30	2	N/A	N/A	N/A	N/A
TRUSTSAT[z]	N/A	0	5	9	20	1	N/A	N/A	N/A	N/A
DIVIM[aa]	N/A	0	0	4	25	6	N/A	N/A	N/A	N/A
DIVSAT[bb]	N/A	5	14	2	9	5	N/A	N/A	N/A	N/A
SEX[cc]	27	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

AGE[dd]	N/A	N/A	N/A	N/A	N/A	N/A	44.29	N/A	30	63
EDUCATION[ff]	0	32	3	0	N/A	N/A	N/A	N/A	N/A	N/A
FAMILYSIZE[ll]	N/A	N/A	N/A	N/A	N/A	N/A	4.17	N/A	2	6
INCOME[gg]	5	10	11	6	4	N/A	N/A	N/A	N/A	N/A
FARMSIZE[hh]	N/A	N/A	N/A	N/A	N/A	N/A	10.31	N/A	6	28
OWNED/RENT[ii]	3	32	N/A	N/A	N/A	N/A	5.94	N/A	0	18
CROP[jj]	32	18	4	0	N/A	N/A	N/A	N/A	N/A	N/A
MARKETAGENT[kk]	N/A	0	5	15	13	2	N/A	N/A	N/A	N/A
WHENSOLD[ll]	3	2	19	1	10	0	N/A	N/A	N/A	N/A
WHENSOLD	16	2	17	0	0	0	N/A	N/A	N/A	N/A
MEMBER[mm]	21	14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LONGAG[nn]	0	1	3	13	17	1	N/A	N/A	N/A	N/A
POOLMON[oo]	N/A	0	0	1	23	11	N/A	N/A	N/A	N/A
POOLLAB[pp]	N/A	0	0	2	25	8	N/A	N/A	N/A	N/A

a The variable AGENT has a value of 1 if the farmer sold most of his/her agricultural produce to either the Sanpatong or HangDong cooperative, 0 if sold to a wholesaler or somewhere else, 2 if sold to both the cooperative and the wholesaler. Observations excluded if no agricultural products sold.

b The variable AGENTRICE has a value of 1 if the farmer sold most of his/her rice to either the Sanpatong or the HangDong cooperative and 0 if sold to a wholesaler or somewhere else, and 2 if sold to the cooperative and wholesaler. Observations excluded if no rice sold.

c The variable AGENTSOY has a value of 1 if the farmer sold most of his/her soybeans to either the Sanpatong or the HangDong cooperative and 0 if sold to a wholesaler or somewhere else, and 2 if sold to both the cooperative and wholesaler. Observations excluded if no soybeans sold.

d The variable AGENTON has a value of 1 if the farmer sold most of his/her onions to the onion cooperative and 0 if sold elsewhere (ie wholesaler). Observations excluded if no onions sold.

e PRICEIM is the farmer's rating from 1 to 5 of the importance that price is to his/her decision of marketing agent.

f PRICESAT is the farmer's rating from 1 to 5 of the satisfaction of the price he/she receives from his/her market agent.

g INPUTIM is the farmer's rating from 1 to 5 of the importance of quantity and quality of input supplies to his/her decision of input supply agent.

h INPUTSAT is the farmer's rating from 1 to 5 of the satisfaction of the input supplies he/she receives from his/her input supply agent.

i CAIM is the farmer's rating from 1 to 5 of the importance of the credit available to his/her decision of lending agent.

j CASAT is the farmer's rating from 1 to 5 of the satisfaction of credit available he/she receives from his/her lending agent.

k CCIM is the farmer's rating from 1 to 5 of the importance of the interest rate to his/her decision of lending agent.

l CCSAT is the farmer's rating from 1 to 5 of the satisfaction of the interest rate to his/her decision of lending agent.

m LOCATIONIM is the farmer's rating from 1 to 5 of the importance of the location of his/her market agent.

n LOCATIONSAT is the farmer's rating from 1 to 5 of the satisfaction he/she gets from the location of his/her marketing agent.

o TIMEIM is the farmer's rating from 1 to 5 of the importance of the time purchased to his/her decision of marketing agent.

p TIMSAT is the farmer's rating from 1 to 5 of the satisfaction he/she gets from the time of purchase of the marketing agent.

q STORAGEIM is the farmer's rating from 1 to 5 of the importance of the storage by the marketing agent to his/her decision of a marketing agent.

r STORAGESAT is the farmer's rating from 1 to 5 of the satisfaction of the storage offered by the marketing agent or the storage used by the farmer (including his own).

s GRADINGIM is the farmer's rating from 1 to 5 of the importance of having grading of the agricultural product done by the marketing agent.
t GRADINGSAT is the farmer's rating from 1 to 5 of the satisfaction received by having the marketing agent grading or not grading the agriculture product.
u MIIM is the farmer's rating from 1 to 5 of the importance of receiving market information from his/her marketing agent
v MISAT is the farmer's rating from 1 to 5 of the satisfaction of the market information he/sne recieved from his/her marketing agent.
w TRAININGIM is the farmer's rating from 1 to 5 of the importance of receiving training (ie.chemical use, fertilizer application, crop production methods, seeding methods, etc..) from his/her marketing agent.
x TRAININGSAT is the farmer's rating from 1 to 5 of the satisfaction of the training he/she received from his/her marketing agent.
y TRUSTIM is the farmer's rating from 1 to 5 of the importance of trusting his/her marketing/lending/input supply agent
z TRUSTSAT is the farmer's rating from 1 to 5 of the satisfaction perceived from the trust had with his/her marketing/lending/input supply agent.
aa DIVIM is the farmer's rating from 1 to 5 of the importance of receiving dividends from his/her marketing agent
bb DIVSAT is the farmer's rating from 1 to 5 of the satisfaction he/she receives from getting dividends from his/her marketing agent.
cc SEX is the sex of the farmer interviewed; 0 if male and 1 if female.
dd AGE is the age of the farmer interviewed.
ee FAMILYSIZE is the size of the family supported by the farmer interviewed.
ff EDUCATION is the education of the farmer interviewed; 0 if no education, 1 if primary education, 2 if secondary education, and 3 if college education.
gg INCOME is the income of the farmer interviewed on a scale from 0 to 4; 0 is less than 20,000 baht, 1 is between 20,000 and 30,000 baht, 2 is between 30,000 and 40,000 baht, 3 is between 40,000 and 50,000 baht, and 4 is greater than 50,000 baht.
hh FARMSIZE is the number of rai the farmer either owns or rents.
ii OWNED/RENT is 0 if the farmer rents 30% of his/her land and 1 if the farmer owns 70% of his/her land; average of the number of rai owned.
jj CROP is 0 if rice, 1 if soybeans, and 2 if garlic, 3 if onions.
kk MARKETAGENT is the farmer's rating from 1 to 5 of how they perceive their marketing agent(s).
ll WHENSOLD is 0 if product not sold, 1 if sold after harvest, 2 if sold when the farmer needed the money, 3 if sold when at the highest price, 4 if other; 1st row is rice and 2nd row is soybeans and other products.
mm MEMBER is the farmer a member of the cooperative, if yes 1, if no 0.
nn LONGAG is how long the farmer has sold to his/her present marketing agent 0 if different buyers. 1 if more than 5 years, 2 if between 1 and 5 years, 3 if fist year, 4 if not sold, 5 if unknown; average numbers of years the coop member has been a member of the coop.
oo POOLMON is a the farmer's rating from 1 to 5 of how willing the farmer is to pooling money in his/her respective village for credit purposes; 5 is very willing and 1 is not willing to pool money.
pp POOLLAB is the farmer's rating from 1 to 5 of how willing the farmer is to jointly pooling his/her labor in his/her respective village in a cooperative effort; 5 is very willing and 1 is not willing to pool labor.
qq VILLAGE is a variable for each of the villages in the Banmae subdistrict.
rr SUBDISTRICT is a dummy variable for the Banmae subdistrict in the Sanpatong district.

Total number of those interviewed in each category may not add to the total number of farmers interviewed because of missing observations, etc...

Table 12: Tabulation Table, absolute values and percentages

	Farmer's Survey												Manager's Survey		
	Absolute values							% values Absolute values							
	Sanpatong									Hangdong					
	wh.	coop	both	oncoop	onwh	nnac	total	wh.	coop	wh.	coop	both	Manager		
Variable	1	2	3	4		5		%	%	0	1	2	S	M	O
Pricem1	0	0	0	0	0	0	0	0.00	0.00	0	0	0			
Pricem2	0	0	0	0	0	1	1	0.00	0.00	0	0	0			
Pricem3	0	0	0	0	0	8	8	0.00	0.00	0	0	0			
Pricem4	16	17	2	1	0	7	42	12.40	9.19	18	6	0			
Pricem5	108	166	36	44	8	8	373	87.60	90.81	7	3	1			
Average	4.88	4.91	4.95	4.98	5.00	3.96	4.86			4.28	4.33	5.00			
Pricesat1	3	2	1	1	0	6	13	2.48	1.08	0	1	0			
Pricesat2	23	41	11	8	2	9	95	19.01	22.16	15	4	0			
Pricesat3	39	66	8	8	0	10	125	32.23	31.89	7	6	0			
Pricesat4	46	75	16	25	4	0	164	36.02	40.54	2	4	1			
Pricesat5	12	5	4	3	2	0	27	8.26	4.38	1	1	0			
Average	3.31	3.25	3.28	3.40	3.75	2.16	3.23			2.56	2.78	4.00			
Inputsm1	2	0	0	0	0	0	2	1.65	0.00	0	0	0			
Inputsm2	0	1	0	0	0	4	6	0.00	0.54	0	0	0			
Inputsm3	11	11	2	3	0	6	33	9.09	5.95	2	1	0			
Inputsm4	82	106	21	19	3	12	243	67.77	57.30	20	8	1			
Inputsm5	26	67	10	23	5	9	140	21.49	36.22	3	2	0			
Average	4.07	4.29	4.30	4.44	4.63	3.56	4.21			4.04	3.89	4.00			
Inputsat1	3	0	2	2	1	4	12	2.48	0.00	0	0	0			
Inputsat2	22	29	8	6	0	11	76	18.18	15.68	7	1	0			
Inputsat3	56	64	11	10	1	8	141	46.28	29.19	7	1	0			
Inputsat4	31	87	16	19	4	2	164	30.56	47.03	10	3	1			
Inputsat5	9	15	3	8	2	0	31	2.48	8.11	1	0	0			
Average	3.12	3.48	3.23	3.56	3.75	2.32	3.30			3.20	3.67	4.00			
Cam1	4	2	3	0	0	3	11	3.31	1.08	1	0	0			
Cam2	5	6	3	2	0	7	22	4.13	2.70	2	0	0			
Cam3	43	64	12	17	3	4	140	35.54	32.97	5	2	0			
Cam4	54	77	11	7	4	8	135	28.10	37.84	17	6	1			
Cam5	30	47	11	16	1	3	116	28.93	25.41	0	1	0			
Average	3.95	3.84	3.68	3.96	3.75	3.04	3.76			3.52	3.89	4.00			
Casat1	16	15	10	4	2	13	55	13.22	5.41	0	0	0			
Casat2	16	17	8	3	0	5	49	13.22	8.19	5	1	0			
Casat3	45	87	8	20	3	1	164	37.19	47.03	8	2	0			
Casat4	32	55	11	12	2	5	111	26.45	29.11	13	6	1			
Casat5	13	10	3	6	1	2	45	6.86	10.27	1	1	0			
Average	3.67	3.29	2.83	3.29	3.00	2.00	3.10			3.48	3.56	4.00			
Cosm1	3	2	2	0	0	2	9	2.48	1.08	0	0	0			
Cosm2	3	6	4	2	0	7	23	2.48	3.78	0	0	0			
Cosm3	48	76	13	21	6	5	168	39.67	41.08	2	2	0			
Cosm4	35	64	11	12	2	5	120	28.93	28.73	23	8	1			
Cosm5	32	45	11	12	1	3	104	26.45	24.32	2	2	0			
Average	3.74	3.72	3.68	3.71	3.50	3.00	3.68			3.92	4.00	4.00			
Cosat1	14	20	10	5	2	13	64	12.40	10.81	0	0	0			
Cosat2	19	30	8	8	1	6	70	15.70	16.22	2	2	0			
Cosat3	49	84	11	20	4	3	181	39.67	49.73	12	4	0			
Cosat4	32	50	11	8	2	3	90	26.45	18.92	3	3	1			
Cosat5	13	8	3	3	1	2	39	5.79	4.32	2	0	0			
Average	2.98	2.90	2.78	2.82	2.88	1.84	2.83			3.08	3.11	4.00			
Locm1	0	0	0	0	0	0	0	0.00	0.00	1	0	0			
Locm2	1	1	2	0	0	5	9	0.83	0.54	0	1	0			
Locm3	20	26	3	5	1	11	65	16.53	14.05	3	1	0			
Locm4	68	108	24	26	5	6	228	62.20	57.84	20	8	1			
Locm5	31	47	9	22	4	3	122	20.48	27.57	1	2	0			
Average	4.08	4.12	4.14	4.33	4.38	3.28	4.09			3.80	3.78	4.00			
Locsat1	2	3	0	1	1	5	10	0.00	1.08	1	0	0			
Locsat2	17	23	6	6	1	11	57	8.26	12.43	4	1	0			
Locsat3	58	87	20	17	2	8	162	31.40	47.03	3	2	0			
Locsat4	80	86	20	18	1	0	166	49.56	38.14	18	4	1			
Locsat5	13	8	3	3	2	2	29	10.74	4.32	1	0	0			
Average	3.63	3.39	3.68	3.33	3.50	2.16	3.35			3.52	3.67	4.00			
Timem1	0	0	0	0	0	0	1	0.00	0.54	0	0	0			
Timem2	2	4	0	1	0	5	10	0.00	2.16	1	1	0			
Timem3	23	30	4	8	1	10	76	19.01	16.22	4	1	0			
Timem4	66	81	20	14	3	7	184	46.28	43.78	18	7	0			
Timem5	42	68	13	23	4	3	153	34.71	37.30	1	0	0			
Average	4.16	4.15	4.23	4.27	4.38	3.32	4.13			3.76	3.67	3.00			
Timesat1	4	1	1	0	0	4	10	3.31	0.54	2	0	0			
Timesat2	9	24	6	3	0	10	46	7.44	12.97	2	1	0			
Timesat3	52	53	8	10	3	5	113	26.45	28.65	6	2	0			
Timesat4	50	67	28	20	2	1	168	41.32	36.22	15	4	1			
Timesat5	26	40	4	12	3	2	87	21.49	21.62	6	2	0			
Average	3.70	3.65	3.85	3.91	4.00	2.48	3.65			3.36	3.11	4.00			
Stm1	0	1	0	1	0	0	2	0.00	0.70	2	1	0			
Stm2	3	3	3	2	0	0	11	2.48	4.32	4	0	0			
Stm3	26	41	6	5	0	2	86	21.49	26.41	5	1	0			
Stm4	58	80	21	10	4	8	131	31.40	32.43	13	1	1			
Stm5	44	69	26	21	4	10	185	42.63	35.14	1	0	0			
Average	4.18	3.93	4.20	4.33	4.50	4.52	4.12			3.28	3.56	4.00			
Stsat1	4	4	0	2	0	0	10	3.31	2.16	2	0	0			
Stsat2	8	18	3	1	0	2	31	6.61	8.73	2	0	0			
Stsat3	34	67	11	8	1	6	128	28.10	36.22	6	4	0			
Stsat4	36	53	16	10	5	12	135	32.23	28.65	13	5	1			
Stsat5	36	43	11	20	2	5	120	28.76	23.24	2	0	0			
Average	3.79	3.61	3.90	4.13	4.13	3.80	3.76			3.44	3.56	4.00			
Gracm1	1	1	0	1	0	1	4	1.65	2.70	2	1	0			
Gracm2	14	7	3	1	0	5	34	11.57	3.78	6	3	1			
Gracm3	54	84	13	12	5	14	182	44.63	45.41	5	1	0			
Gracm4	42	71	19	20	1	5	158	36.36	38.92	6	4	0			

Variable	wh.	coop	both	oncoop	onwh	nnar	total	wh.	coop	wh.	coop	both	Manager		
	1	2	3	4		5		%	%	0	1	2	S	H	O
Gradm5	3	17	3	11	2	0	40	5.78	9.18	1	0	0			
Average	3.33	3.48	3.33	3.87	3.63	2.92	3.43			2.52	2.89	2.00			
Gradsat1	6	6	2	3	0	8	25	4.96	3.24	0	0	0			
Gradsat2	20	33	5	5	1	4	68	16.53	17.84	6	1	0			
Gradsat3	72	101	14	13	3	13	216	59.50	54.59	5	2	0			
Gradsat4	20	40	17	21	3	0	101	16.53	21.62	12	6	1			
Gradsat5	3	5	2	3	1	0	14	2.48	2.70	2	0	0			
Average	2.95	3.03	3.30	3.36	3.50	2.20	3.03			3.40	3.56	4.00			
Mism1	0	1	0	0	0	0	1	0.00	0.54	0	0	0			
Mism2	0	1	0	0	0	2	3	0.00	0.54	0	0	0			
Mism3	29	29	6	3	2	8	77	23.97	15.68	6	0	0			
Mism4	66	94	21	23	2	13	222	57.02	50.81	16	8	1			
Mism5	23	60	13	19	4	2	121	18.01	32.43	3	0	0			
Average	3.95	4.14	4.18	4.36	4.25	3.60	4.08			3.88	4.00	4.00			
Misat1	11	15	2	2	1	2	31	9.09	7.03	1	0	0			
Misat2	36	27	8	6	1	17	95	29.75	14.59	7	1	1			
Misat3	63	78	21	16	4	6	179	43.80	42.70	6	4	0			
Misat4	16	60	7	16	2	0	103	13.22	32.43	10	4	0			
Misat5	5	6	2	3	0	0	16	4.13	3.24	1	0	0			
Average	2.74	3.10	2.98	3.31	2.88	2.16	2.95			3.12	3.33	2.00			
Trainm1	1	1	0	0	0	0	2	0.83	0.54	0	0	0			
Trainm2	3	0	1	0	0	4	8	2.48	0.00	0	0	0			
Trainm3	29	27	9	4	0	8	77	23.97	14.59	2	1	0			
Trainm4	55	96	17	15	4	11	198	45.45	51.89	22	8	1			
Trainm5	33	61	13	26	4	2	139	27.27	32.97	1	0	0			
Average	3.96	4.17	4.05	4.49	4.50	3.44	4.09			3.96	3.89	4.00			
Trainsat1	23	22	7	8	1	6	67	19.01	11.89	0	0	0			
Trainsat2	43	42	9	8	4	14	120	35.54	22.70	6	1	0			
Trainsat3	34	54	12	10	0	3	113	28.10	29.19	7	2	0			
Trainsat4	18	62	11	15	2	2	110	14.88	33.51	11	6	1			
Trainsat5	3	5	1	4	1	0	14	2.48	2.70	1	0	0			
Average	2.46	2.92	2.78	2.98	2.75	2.04	2.73			3.28	3.56	4.00			
Trustm1	0	0	2	0	0	4	6	0.00	0.00	0	0	0			
Trustm2	3	4	2	1	0	6	16	2.48	2.16	0	0	0			
Trustm3	42	34	6	8	0	6	96	34.71	18.38	3	0	0			
Trustm4	60	93	20	24	7	8	212	49.59	50.27	20	8	1			
Trustm5	16	54	10	12	1	1	94	13.22	29.19	2	0	0			
Average	3.74	4.06	3.85	4.04	4.13	2.84	3.88			3.96	4.00	4.00			
Trustsat1	2	1	6	2	0	12	22	1.65	0.54	0	0	0			
Trustsat2	26	11	4	5	1	7	54	21.49	5.95	5	0	0			
Trustsat3	59	66	13	12	1	2	152	48.76	35.14	8	1	0			
Trustsat4	27	82	14	20	6	4	153	22.31	44.32	11	8	1			
Trustsat5	7	26	4	8	0	0	43	5.79	14.05	1	0	0			
Average	3.09	3.65	3.20	3.51	3.63	1.92	3.33			3.32	3.89	4.00			
Divm1	2	3	4	0	0	4	13	1.65	1.62	0	0	0			
Divm2	12	6	4	3	1	7	33	9.92	3.24	0	0	0			
Divm3	56	31	10	7	0	7	111	46.28	16.76	4	0	0			
Divm4	38	92	9	10	3	5	157	31.40	49.73	16	8	1			
Divm5	13	53	13	26	4	1	110	10.74	28.65	5	1	0			
Average	3.40	4.01	3.58	4.27	4.25	2.76	3.75			4.04	4.11	4.00			
Divsat1	33	11	13	3	2	0	62	27.27	5.95	5	0	0			
Divsat2	22	26	6	5	1	17	77	18.18	14.05	12	2	0			
Divsat3	49	76	12	16	3	3	159	40.50	40.54	1	1	0			
Divsat4	13	60	5	12	0	2	92	10.74	32.43	2	6	1			
Divsat5	4	13	4	7	2	4	34	3.31	7.03	5	0	0			
Average	2.45	3.21	2.53	3.33	2.88	2.72	2.90			2.60	3.44	4.00			
Coopmem	38	144	15	36	4	7	247	28.93	77.84	20	1	0			
Income1	58	92	18	17	3	21	209	47.93	49.73	5	0	0			
Income2	36	44	13	6	5	3	110	32.23	23.78	8	2	0			
Income3	11	23	7	9	0	0	50	9.09	12.43	7	3	1			
Income4	5	16	2	7	0	1	31	4.13	8.65	1	4	0			
Income5	6	10	0	6	0	2	24	6.61	5.41	4	0	0			
Average	1.89	1.96	1.83	2.53	1.63	1.24	1.94			2.04	3.22	3.00			
Hicespin	54	76	36	24	4	2	196	45.00	41.08	24	6	1			
Socspin	83	178	35	24	6	1	341	77.50	96.22	10	6	1			
Gallicspin	13	2	4	1	1	1	22	10.74	1.08	1	1	1			
Fairpwres	108	162	26	16	3	25	340	89.26	87.57	22	8	1			
Subdistrict	71	142	26	43	3	10	305	58.68	76.76	26	7	1			
Longag1	23	8	11	6	2	1	51	19.83	4.44	14	3	0			
Longag2	58	116	22	30	5	1	232	50.86	63.89	7	5	1			
Longag3	28	55	5	8	1	4	102	25.00	30.56	2	1	0			
Longag4	5	2	0	0	0	0	7	4.31	1.11	1	0	0			
Educ1	10	11	2	2	0	0	25	8.26	5.95	0	0	0			
Educ2	105	164	36	40	7	22	376	86.78	88.65	24	7	1			
Educ3	5	8	0	3	1	3	20	4.13	4.32	1	2	0			
Educ4	1	1	0	0	0	0	2	0.83	0.54	0	0	0			
Average	1.98	1.99	1.95	2.02	2.13	2.12	2.00			2.04	2.22	2.00			
MK1	3.06	2.66	3.16	2.96	0.00	2.06	22	9.31	3.78	3	0	0			
MK2	19	17	5	8	3	1	54	15.70	9.19	5	0	0			
MK3	47	46	11	13	0	6	125	38.84	24.86	12	3	0			
MK4	45	91	18	20	6	8	188	37.19	49.19	6	6	0			
MK5	5	24	8	1	0	0	35	4.96	12.97	2	0	1			
Average	3.25	3.58	3.43	3.20	3.25	2.76	3.38			3.20	3.67	0.00			

Wh. is defined as the wholesalers

oncoop is defined as the Banuk 'onion' cooperative

nnar is defined as the choice set variable for not selling (nonparticipation)

Identifies the manager's perception for each of the attributes for the Sanpatong cooperative (S)

Identifies the managers' perceptions for each of the attributes for the HangDong cooperative (H)

Identifies the manager's perception for each of the attributes for the Banuk 'onion' cooperative (O)

Table 13: Binomial and Multinomial Models, Sanpatong District

Binomial Models				Multinomial Models							
306 #: 185 cooperative, 121 wholesalers				346 #: 185 cooperative, 121 wholesalers, 40 both							
Variable	Model 1	Model 2	Model 3	Model 4		Model 5		Model 6		Model 7	
				Coop	Both	coop	both	Coop	Both	Coop	Both
	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef
Constant	-0.31389	-3.31	-1.4088	-1.7187	-2.9156	0.5894	-0.31215	-1.784	-6.1779	-3.7	**-10.07**
(S.D.)	(1.666)	(2.757)	(2.504)	(1.226)	(1.732)	(0.9207)	(1.33)	(2.164)	(21.67)	(3)	(4.886)
Pricesat2								1.4563	-0.64017		
								(1.372)	(1.936)		
Pricesat3								1.3466	-1.1888		
								(1.352)	(1.786)		
Pricesat4								0.904	-0.6822		
								(1.38)	(1.903)		
Pricesat5								-0.672	0.0403		
								(1.579)	(2.052)		
Inputsat3	0.11036	-0.123	0.46824	0.25494	0.11143	0.31784	0.0952	0.6306	0.48594	0.20243	2.064
	(0.5717)	(0.636)	(0.6093)	(0.4825)	(0.6237)	(0.4477)	(0.6013)	(0.5943)	(0.8867)	(0.702)	(1.606)
Inputsat4	0.38907	0.097	**1.162****	0.8625	0.83298	**0.917***	0.59033	**1.61****	0.56516	0.40383	1.77
	(0.6082)	(0.6799)	(0.7415)	(0.5159)	(0.6809)	(0.4808)	(0.6494)	(0.7329)	(0.9977)	(0.761)	(1.62)
Inputsat5	**2.31****	1.7979	**2.703****	2.7522	**2.71****	**1.73****	1.6066	**3.24****	2.0619	**2.74****	**5.04***
	(1.151)	(1.127)	(1.241)	(0.9812)	(1.29)	(0.8769)	(1.119)	(1.238)	(1.672)	(1.296)	(2.634)
Casat2			1.324							1.3186	2.43
			(1.413)							(1.609)	(3)
Casat3	**1.7025****	1.2832	2.0036	**1.274****	**1.913****	**1.36****	-1.081	1.1	**-3.28****	2.0458	**-6.79***
	(0.6923)	(0.698)	(1.289)	(0.5761)	(0.8853)	(0.5371)	(0.8133)	(0.6732)	(1.424)	(1.637)	(3.557)
Casat4	0.16734	0.166	1.5914	**1.05***	-1.339	**1.18****	-1.2626	0.5976	**-3.79****	1.309	**-6.4***
	(0.7069)	(0.788)	(1.315)	(0.6266)	(0.996)	(0.5616)	(0.8925)	(0.7446)	(1.475)	(1.569)	(3.471)
Casat5	-0.00582	-0.5666	1.0349	0.76545	-0.3925	**1.495***	-0.51757	0.411	**-3.83****	0.8722	-4.24
	(1.043)	(1.084)	(1.465)	(0.9115)	(1.237)	(0.8076)	(1.07)	(1.032)	(1.732)	(1.77)	(3.594)
Caim3	1.8699	**3.136****		1.5576	**2.515****					3.08	-2.156
	(1.219)	(1.49)		(1.051)	(1.275)					(3.08)	(3.043)
Caim4	1.9574	**2.463***		**1.995***	1.913					2.6779	-2.5928
	(1.219)	(1.404)		(1.025)	(1.258)					(3.06)	(3.253)
Caim5	0.98322	1.02		0.508	0.26369					1.09	**7.34***
	(1.32)	(1.453)		(1.078)	(1.316)					(3.134)	(3.935)
CCsat2			-0.0526							-0.48	-6.08
			(1.239)							(1.414)	(3.225)
CCsat3	-0.7998	-0.75	-1.0545	-0.4782	0.188	**-0.965***	-0.14553	-1.07	0.8686	-1.2236	1.63
	(0.6419)	(0.7019)	(1.164)	(0.5457)	(0.809)	(0.5291)	(0.7866)	(0.689)	(1.311)	(1.411)	(2.92)
CCsat4	**1.781****	-1.2278	-1.9892	**2.015****	0.38875	**1.752****	-0.15993	**2.17****	0.8335	-2.3557	2.4977
	(0.7811)	(0.877)	(1.264)	(0.6566)	(0.968)	(0.6)	(0.9012)	(0.831)	(1.455)	(1.494)	(3.063)
CCsat5	-1.431	-2	-1.2062	-1.7088	0.1518	**-2.269****	-0.49413	-1.664	2.023	-2.358	2.3559
	(1.26)	(1.387)	(1.591)	(1.07)	(1.362)	(1.013)	(1.322)	(1.28)	(2.023)	(1.824)	(3.936)
CCim3	**2.511***	**4.82****		**2.555****	**2.95****					-1.6761	-7.09
	(1.433)	(1.772)		(1.125)	(1.337)					(3.443)	(4.754)
CCim4	-2.1186	**-4.14****		**-2.1***	**2.66****					-1.35	5.279
	(1.363)	(1.788)		(1.128)	(1.343)					(3.39)	(4.952)
CCim5	-0.59523	-2.1653		-0.502	-1.3134					1.291	**10***
	(1.363)	(1.823)		(1.189)	(1.409)					(3.473)	(5.6)
Tosat3	-0.35552	-0.23	-0.00053	-0.40429	**-1.26***	-0.19705	**-1.31***	0.171	-0.6379	0.160	**2.9****
	(0.6549)	(0.7177)	(0.6849)	(0.5287)	(0.7559)	(0.5469)	(0.7382)	(0.6634)	(1.054)	(0.7658)	(1.339)
Tosat4	**-1.38****	**-1.28***	**-1.42****	-1.1446	-0.68948	**1.23****	**-1.83****	**1.297***	-1.067	**-1.55***	**-2.7****
	(0.6663)	(0.74)	(0.7184)	(0.5351)	(0.6821)	(0.5698)	(0.7239)	(0.6927)	(1.037)	(0.7941)	(1.341)
Tosat5	**-2.72****	**-3.04****	**-3.05****	-3.02	**-2.56****	**-2.31****	**-2.66****	**2.92****	-2.5	**-3.33****	**-8.61****
	(1.034)	(1.078)	(1.121)	(0.7805)	(1.057)	(0.7631)	(0.9903)	(1.045)	(1.588)	(1.162)	(2.614)
Timesat3		-0.21314	-0.22367			0.051529	**2.03***	-0.33546	2.1795	0.38212	**5.186***
		(0.786)	(0.7477)			(0.5394)	(1.322)	(0.7325)	(1.701)	(0.9345)	(2.792)
Timesat4		0.425	0.0722			0.20053	**3.285****	-0.00036	**4.02****	0.72689	**7.45****
		(0.753)	(0.7431)			(0.5357)	(1.212)	(0.7315)	(1.759)	(0.924)	(3.053)
Timesat5		0.6879	0.23586			0.17892	**2.31***	-0.03313	**3.47***	1.0605	**5.85***
		(1)	(0.9414)			(0.6154)	(1.337)	(0.8852)	(1.861)	(1.147)	(3.154)
Cons3										0.648	0.47296
										(0.6432)	(1.113)

Variable	Model 1	Model 2	Model 3	Model 4		Model 5		Model 6		Model 7	
Stim3	-1.07	-1.357								-1.549	**-3.98****
	(1.018)	(1.261)								(1.21)	(2.017)
Stim4	-1.1776	-1.345								-1.01	**-3.38***
	(0.9775)	(1.217)								(1.143)	(1.903)
Stim5	**-1.714***	**-2.68***								**-2.3***	**-3.23***
	(0.9979)	(1.369)								(1.258)	(1.843)
Gradsat3										0.51765	0.68
										(0.6207)	(1.131)
Gradsat4										0.55412	2.29
										(0.7545)	(1.237)
Gradsat5										-0.1395	2.4839
										(1.506)	(2.291)
Gradim3		1.4349									
		(0.8958)									
Gradim4		1.2097									
		(0.8771)									
Gradim5		2.06									
		(1.126)									
Misat3	0.7685	0.85	**1.216****					**1.365****	**1.743****	1.4293	2.72
	(0.4643)	(0.5247)	(0.4993)					(0.493)	(0.6964)	(0.5997)	(1.075)
Misat4	1.5227	**1.25***	**1.69****					**1.907****	0.769	2.0327	-0.416
	(0.6022)	(0.751)	(0.6812)					(0.6636)	(1.09)	(0.85)	(1.846)
Misat5	0.39558	-0.2795	0.67787					1.134	-0.5	2.414	-0.72
	(1.103)	(1.56)	(1.382)					(1.314)	(1.621)	(1.736)	(3.065)
Stimsat3										0.91376	-0.504
										(0.5931)	(1.218)
Tramsat2										0.19243	-2.088
										(0.7686)	(1.416)
Tramsat3		0.11								0.4772	-1.394
		(0.557)								(0.8187)	(1.467)
Tramsat4		-0.177								-0.1017	1.7383
		(0.7288)								(0.999)	(2.036)
Tramsat5		-0.751								-2.97	-1.2588
		(2.04)								(2.428)	(4.132)
Tramim3		1.9235									
		(1.711)									
Tramim4		2.445									
		(1.723)									
Tramim5		2.69									
		(1.764)									
Trustsat3	0.14682	0.16768	0.89584					1.0373	0.34588	0.3555	2.18
	(0.611)	(0.7205)	(0.6951)					(0.6828)	(0.9948)	(0.762)	(1.64)
Trustsat4	0.37645	0.874	**1.48***					1.6791	0.52967	1.2184	1.274
	(0.6732)	(0.81)	(0.804)					(0.7945)	(1.093)	(0.872)	(1.699)
Trustsat5	0.39422	0.10955	1.6499					1.1424	0.44753	1.405	0.51176
	(0.9895)	(1.237)	(1.264)					(1.262)	(1.734)	(1.394)	(2.419)
Trustim3		-2.32	-1.5106			**-1.88****	**-2.5****	-0.929	**-2.8****	-2.675	**-9.8****
		(1.683)	(1.516)			(0.8959)	(1.048)	(1.349)	(1.734)	(1.948)	(3.863)
Trustim4		-2.5	-1.3881			**-1.48***	**-1.85****	-0.9779	-1.81	-3.1	**-6.65***
		(1.686)	(1.524)			(0.8835)	(0.9215)	(1.341)	(1.76)	(1.95)	(3.499)
Trustim5		-1.754	-0.28465			-0.51359	-0.95396	0.38814	-1.2532	-2.3	-4.81
		(1.847)	(1.594)			(0.9255)	(1.08)	(1.472)	(1.816)	(2.015)	(3.307)
Divsat3	0.39013	0.3358	0.54684	**0.664***	-0.48585			0.42506	-0.2505	0.06556	-0.981
	(0.4947)	(0.5248)	(0.5173)	(0.3671)	(0.51)			(0.5073)	(0.8008)	(0.58)	(1.015)
Divsat4	0.88	1.13	1.1276	**2.21****	-0.19242			1.0305	-0.7132	1.043	-1.6527
	(0.68)	(0.729)	(0.7303)	(0.5199)	(0.7388)			(0.7146)	(1.145)	(0.812)	(1.46)
Divsat5	0.92298	2.086	0.8359	**2.483****	1.2549			1.0204	0.86	2.2795	1.194
	(1.05)	(1.29)	(1.227)	(0.8435)	(1.042)			(1.233)	(1.634)	(1.411)	(2.905)
Divim3	-0.82034	-0.392	-1.3824							-0.286	**3.01***
	(0.7574)	(1.14)	(0.9521)							(1.139)	(1.814)
Divim4	0.087442	**2.06***	0.1817							1.799	1.475
	(0.8045)	(1.165)	(0.9729)							(1.136)	(1.793)
Divim5	0.06633	**2.179***	-0.0302							1.403	**3.58***
	(0.9224)	(1.309)	(1.087)							(1.256)	(2.018)
Coopmem	**1.7****					**2.166****	0.69375				
	(0.4772)					(0.3289)	(0.4614)				
Income1	-0.68755									**1.16****	0.56
	(0.4194)									(0.5192)	(0.931)
Income2	-0.831									0.5339	0.976
	(0.6525)									(0.8329)	(1.398)
Income3	-0.01466									1.5417	-0.1984
	(0.741)									-1.177	(2.106)
Income4										1.154	
										(1.095)	
Farmsize		0.161									
		(0.067)									
Soysold		**2.454****	**1.579****	**2.113****	**3.591****					**3.14****	**5.03****
		(0.73)	(0.7411)	(0.5918)	(1.146)					(0.878)	(1.65)
Garlicsold		-1.69	-1.21	-1.93*	1.495**					-2.43	**4.05****
		(1.394)	(1.191)	(1.017)	(0.8483)					(1.538)	(1.887)
Petowned			0.23594							0.18*	-1.55

Variable	Model 1	Model 2	Model 3	Model 4		Model 5		Model 6		Model 7	
			(0.4782)							(0.5188)	-0.7982
Subdist	0.6004	0.594		**0.78****	0.66818					1.0625	0.9789
	(0.4137)	(0.475)		(0.3389)	(0.5023)					(0.5384)	(1.04)
LONGAG1	**1.68****	**1.72****	**1.34****					**1.31****	-0.39319	**2.6****	0.05645
	(0.5292)	(0.5886)	(0.574)					(0.5577)	(0.7854)	(0.686)	(1.126)
LONGAG2	**1.715****	**1.914****	**1.579****					**1.44****	**-1.81***	**2.46****	-2.01
	(0.5756)	(0.6707)	(0.6451)					(0.6328)	(0.9596)	(0.704)	(1.386)
EDUC1										-0.0793	2.055
										(0.9833)	(1.724)
EDUC2										0.39957	-8.096
										(1.598)	(6.24)
EDUC3										-1.297	5.076
										(2.186)	(6.224)
Vill0			0.72497					0.881	-		
			(0.84641)					(0.8596)			
Vill1			1.0257					1.315	-		
			(0.7861)					(0.807)			
Vill2			0.41927					0.51483	-		
			(0.8738)					(0.8511)			
Vill3			-0.35832					-0.22786	-		
			(0.8015)					(0.786)			
Vill4			-0.69884					-0.69793	-		
			(0.8258)					(0.799)			
Vill5			0.26794					0.24931	-		
			(1.051)					(1.036)			
Vill6			0.45521					0.33968	-		
			(1.363)					(1.169)			
Vill7			**-2.05****					**-1.97****	-		
			(0.7792)					(0.7645)			
Vill8			-0.45979					-0.404	-		
			(0.7394)					(0.7028)			
Vill9			-0.92752					-0.65522	-		
			(1.041)					(0.9199)			
Vill10			-0.65787					-0.8691	-		
			(1.125)					(1.074)			
Vill11			0.45161					-0.09716	-		
			(0.9577)					(0.8906)			
Vill12			**1.853***					**1.62***	-		
			(1.02)					(0.9569)			
Mk2	-1.2516	-2.03	-1.7968	-1.3182	-0.4010			-1.9854	(0.3311)	-1.665	2.07
	(1.144)	(1.244)	(1.232)	(0.9276)	(1.213)			(1.194)	(1.698)	(1.3)	(2.302)
Mk3	-1.093	-1.655	-1.9423	-2.0541	-0.46957			-1.6117	-0.0239	-1.32	1.01
	(1.121)	(1.214)	(1.23)	(0.8752)	(1.16)			(1.179)	(1.738)	(1.25)	(2.351)
Mk4	-0.7994	-0.38244	-1.4338	0.031866	0.30511			-1.1234	0.53272	-0.404	2.8
	(1.098)	(1.209)	(1.244)	(0.861)	(1.141)			(1.182)	(1.693)	(1.269)	(2.35)
Mk5	0.04169	-0.691	-0.95948	0.74168	1.0711			-0.64788	0.96836	-0.155	3.91
	(1.287)	(1.429)	(1.452)	(1.025)	(1.323)			(1.384)	(1.966)	(1.502)	(2.708)
Chi-Sq	174.23	192.9	189.23	186.76		165.11		297.66		348.69	
(d.f.)	(44)	(58)	(59)	(56)		(38)		(116)		(142)	
Rho	0.424	0.4697	0.461	0.2836		0.25		0.452		0.5295	
% corre	0.833	0.8398	0.8497	0.714		0.6953		0.792		0.8179	

Estimated using the LIMDEP program

*** significant at 95% significance level**

**** significant at 99% significance level**

= not enough variation in the observations

(d.f.) degrees of freedom

Note: The estimated coefficients do not indicate the increase in the probability of the organization being chosen, given a one-unit increase in the corresponding independent variables. Rather the coefficients reflect the effect of a change in an independent variable on ln[Pi/(1-Pi)]. The amount of increase in probability depends on the original probability and thus on the initial values of all independent variables and their coefficients (Judge, et al., 1985).

Table 14: Analysis of the Satisfaction Variables
Using Ordered Probit Models and Censored Tobit Models
Dependent variables take values 1,2,3,4,5

Dependent variable: PRICESAT **Order Probit Model - Maximum Likelihood Estimation**				**Dependent variable: PRICESAT** **Censored Tobit Model - MLE**			
Independent Variables	B coef	Std	t- ratio	Independent Variables	B coef.	Std.	t- ratio
Constant	1.5963	0.2637	**6.054**	Constant	3.15	0.1114	**28.29**
AGENT	-0.0685	0.08853	-0.774	AGENT	-0.04958	0.08487	-0.584
SUBDISTRICT	0.24013	0.1305	1.84	SUBDISTRICT	0.252	0.1174	**2.146**
SOYBEANS	0.0289	0.2023	0.143	SOYBEANS	-0.000846	0.000999	-0.846
RICE	-0.0002823	0.000527	-0.535	RICE	-0.000213	0.0005927	-0.36
LONGAG1	0.48864	0.1765	**2.768**				
LONGAG2	0.58212	0.1907	**3.052**				
Log-Likelihood		-456.4		Log-Likelihood		-486.93	
% correct		40.2					
Dependent variable: PRICESAT **Order Probit Model - MLE**				**Dependent variable: INPUTSAT** **Censored Tobit Model - MLE**			
Independent Variables	B coef.	Std.	t- ratio	Independent Variables	B coef.	Std.	t- ratio
Constant	1.56	0.2672	**5.839**	Constant	3.1654	0.104	**30.4**
COOPMEM	0.0587	0.1202	0.488	AGENT	0.15624	0.079	**1.972**
SUBDISTRICT	0.22324	0.1309	**1.705**	SUBDISTRICT	0.08894	0.1098	0.81
SOYBEANS	-0.0014454	0.1974	-0.007	SOYBEANS	-0.00083	0.000936	-0.889
RICE	-0.000267	0.0005	-0.532	RICE	0.00071556	0.0005398	1.326
LONGAG1	0.4676	0.1767	**2.647**				
LONGAG2	0.577	0.1904	**3.03**				
Log-Likelihood		-443.35		Log-Likelihood		-466.477	
% correct		39.6					
Dependent variable: CASAT **Censored Tobit Model - MLE**				**Dependent variable: CCSAT** **Censored Tobit Model - MLE**			
Independent Variables	B coef.	Std.	t- ratio	Independent Variables	B coef.	Std.	t- ratio
Constant	3.1698	0.2157	**14.699**	Constant	3.1875	0.198	**16.097**
AGENT	0.01556	0.1179	0.132	AGENT	-0.0722	0.1073	-0.673
SUBDISTRICT	0.0087	0.1633	0.053	SUBDISTRICT	-0.1915	0.15	-1.277
SOYBEANS	-0.00585	0.0112	-0.522	SOYBEANS	-0.005625	0.0128	-0.438
RICE	0.0014794	0.0008237	**1.796**	RICE	0.00119	0.000756	1.578
LONGAG1	-0.0499	0.2037	-0.245	LONGAG1	-0.254	0.1856	-1.37
LONGAG2	0.05794	0.2312	0.251	LONGAG2	0.0419	0.2097	0.2
Log-Likelihood		-558.65		Log-Likelihood		-538.92	
Dependent variable: LOCSAT **Censored Tobit Model - MLE**				**Dependent variable: MISAT** **Censored Tobit Model - MLE**			
Independent Variables	B coef.	Std.	t- ratio	Independent Variables	B coef.	Std.	t- ratio
Constant	3.6543	0.1367	**26.74**	Constant	3.0887	0.2086	**14.81**
AGENT	-0.166	0.0737	**-2.255**	AGENT	0.2425	0.09047	**2.681**
SUBDISTRICT	0.0832	0.1032	0.806	SUBDISTRICT	-0.17123	0.1242	-1.379
SOYBEANS	-0.00027	0.00089	-0.305	SOYBEANS	-0.080457	0.1719	-0.468
RICE	0.0012755	0.0005174	**2.465**	RICE	-0.00038485	0.000603	-0.638
GARLIC	0.076	0.2146	0.356	GARLIC	-0.3449	0.2659	-1.297
LONGAG1	-0.136	0.1282	-1.063	LONGAG1	-0.17534	0.1538	-1.14
LONGAG2	-0.1922	0.145	-1.326	LONGAG2	-0.12825	0.1745	-0.735
Log-Likelihood		-439.97		Log-Likelihood		-495.88	

Dependent variable: TIMESAT **Censored Tobit Model - MLE**			
Independent Variables	B coef.	Std.	t- ratio
Constant	3.623	0.186	**19.48**
AGENT	0.01766	0.1015	0.174
SUBDISTRICT	0.0012829	0.1422	0.009
SOYBEANS	-0.0003715	0.001186	-0.313
RICE	0.00168	0.000704	**2.38**
LONGAG1	0.211	0.1758	1.2
LONGAG2	0.2635	0.2	1.314
Log-Likelihood		-509.499	

Dependent variable: TRAINSAT **Censored Tobit Model - MLE**			
Independent Variables	B coef.	Std.	t- ratio
Constant	2.858	0.2512	**11.376**
AGENT	0.33587	0.1097	**3.061**
SUBDISTRICT	-0.5233	0.1499	-3.49
SOYBEANS	-0.218	0.2078	-1.43
RICE	-0.001035	0.0007233	-1.43
GARLIC	-0.515	0.3235	-1.592
LONGAG1	0.1188	0.1864	0.637
LONGAG2	0.1988	0.2115	0.94
Log-Likelihood		-535.04	

Dependent variable: TRUSTSAT **Censored Tobit Model Model - MLE**			
Independent Variables	B coef.	Std.	t- ratio
Constant	3.22	0.2973	**10.838**
AGENT	0.21188	0.0881	**2.406**
SUBDISTRICT	0.01266	0.121	0.105
SOYBEANS	-0.01884	0.1676	-0.112
RICE	-0.00074	0.0005946	-0.124
GARLIC	-0.64323	0.2618	**-2.457**
LONGAG1	0.1838	0.15	1.225
LONGAG2	0.3022	0.172	**1.758**
Log-Likelihood		-483.7	

Dependent variable: DIVSAT **Censored Tobit Model - MLE**			
Independent Variables	B coef	Std.	t- ratio
Constant	1.05	0.3755	**2.798**
AGENT	0.24654	0.1107	**2.228**
SUBDISTRICT	-0.0443	0.149	-0.297
SOYBEANS	0.045	0.2089	0.216
RICE	0.0002387	0.00075	0.318
GARLIC	-0.469	0.33	-1.416
LONGAG1	0.6423	0.1926	**3.335**
LONGAG2	0.46447	0.2184	**2.127**
Age	0.00171	0.00567	0.3
Log-Likelihood		-475.82	

Estimated using LIMDEP program

Table 15: Special Models

	Model # 5, using marginal probabilities, 3 choices, cooperative, wholesaler, both			Model using nonparticipation, 3 choices, using marginal probabilities, cooperative, wholesaler, nonrticipation				Including the HangDong Coop, 2 choices and a HangDong district dummy variable, Sanpatong + HangDong cooperatives, and wholesalers		Including the Onion Coop, 2 choices and a dummy variable for 'sold onions', Sanpatong coop + onion cooperative, and wholesalers	
Variable	Model 1			Model 2				Model 3	Model 4	Model 5	Model 6
	wholesaler	coop	both	wholesaler	coop	Nonpart.	Nonpart.	coop	coop	coop	coop
	Marginal	Marginal	Marginal	Marginal	Marginal	Marginal	T-stat	B coef	B coef	B coef	B coef
Constant	-0.10378	0.15912	-0.553443	0.195	-0.36	0.1637	**1.733**	0.6908	**-3.5528****	**-1.633****	-0.5251
(S.D.)	(0.2472)	(0.2976)	(0.80225)	(0.4342)	(0.4358)	(0.0945)		(1.349)	(0.8475)	(0.77)	(1.214)
Inputim3				-0.115	0.176	-0.051	-0.89				
				(0.374)	(0.386)	(0.0574					
Inputim4				-0.115	0.217	-0.1	-1.507				
				(0.374)	(0.39)	(0.067)					
Inputim5				-0.219	0.326	-0.11	-1.532				
				(0.398)	(0.4185)	(0.0698)					
Inputsat3	-0.063529	0.07226	-0.008731					0.01139			-0.2211
	(0.1267)	(0.1436)	(0.03725)					(0.44)			(0.4574)
Inputsat4	-0.18237	0.18222	0.0001484					0.4426			0.39*
	(0.1449)	(0.1604)	(0.04078					(0.4485)			(0.467)
Inputsat5	-0.37786	0.3383	0.039577					1.3127			**1.624***
	(0.2343)	(0.2303)						(0.8437)			(0.8914)
Casat3	-0.22929	**0.38596****							**1.0299****	**1.22****	
	(0.1583)	(0.1896)							(0.491)	(0.586)	
Casat4	-0.18664	**0.36089***							**0.96492***	0.74	
	(0.1706)	(0.2077)							(0.5144)	(0.59)	
Casat5	-0.271	0.38937							0.58483	0.346	
	(0.2101)	(0.2397)							(0.7995)	(0.95)	
Caim3				-0.3*	0.31573	-0.007	-0.152				**2.2517****
				(0.36)	(0.366)	(0.046)					(1.1)
Caim4				-0.343	0.32	0.0217	0.469				**2.01***
				(0.37)	(0.359)	(0.046					(1.046)
Caim5				-0.152	0.1355	0.0163	0.323				1.09
				(0.384)	(0.405)	(0.5)					(1.1)
CCsat3	0.18648	-0.22638	0.037987						-0.16376	-0.71825	
	(0.1645)	(0.186)	(0.048)						(0.4491)	(0.566)	
CCsat4	**0.33971***	**-0.41****	0.07713						-0.65477	**-1.686****	
	(0.1956)	(0.2141)	(0.05628)						(0.5308)	(0.652)	
CCsat5	0.44811	**-0.52519***	0.07708						-0.97871	-0.9454	
	(0.2781)	(0.2967)	(0.06604)						(0.9966)	(1.14	
CCim3				0.416	-0.364	-0.032	-0.647				**2.01***
				(0.378)	(0.35)	(0.049)					(1.156)
CCim4				0.505	-0.467	-0.018	-0.383				-1.53
				(0.39)	(0.3496)	(0.047)					(1.15)
CCim5				0.47	-0.44	-0.02999	-0.582				-1.58
				(0.42)	(0.389)	(0.0516)					(1.225)
Iocsat3	0.076324	0.018672	**-0.09489****					-0.22242	0.36591	-0.067	-0.25
	(0.1406)	(0.1576)	(0.05667)					(0.5235)	(0.4802)	(0.67)	(0.567)
Iocsat4	**0.28822***	-0.20516	-0.08306					**-1.5962****	-0.75663	**-1.169****	**-1.398****
	(0.1716)	(0.1547)	(0.05702)					(0.54)	(0.487)	(0.5866)	(0.569)
Iocsat5	**0.51816***	**-0.42321***	-0.094849					**2.1997****	**-1.2774***	**-2.39****	**-2.63****
	(0.267)	(0.2243)	(0.07368)					(0.8174)	(0.6778)	(0.95)	(0.93)
Timesat3	-0.068135	-0.09187	**0.16****						-0.16234		
	(0.2436)	(0.2901)	(0.08078)						(0.5061)		
Timesat4	-0.13271	-0.1203	**0.25303****						-0.093766		
	(0.2619)	(0.2832)	(0.09963)						(0.4846)		
Timesat5	-0.10069	-0.07661	**0.17629***						-0.24417		
	(0.2669)	(0.3136)	(0.09026)						(0.5655)		
Gradsat3											
Gradsat4											
Gradsat5											
Gradim3											
Gradim4											
Gradim5											

Variable	Model 1			Model 2				Model 3	Model 4	Model 5	Model 6
	wholesaler	coop	both	wholesaler	coop	Nonpart.	Nonpart.	coop	coop	coop	coop
	Marginal	Marginal	Marginal	Marginal	Marginal	Marginal	T-stat	B coef.	B coef.	B coef.	B coef.
Misat3								1.1473**	0.35252	0.87**	1.13**
								(0.3676)	(0.364)	(0.41)	(0.383)
Misat4								1.554**	1.1425**	2.17***	2.3***
								(0.5024)	(0.5164)	(0.578)	(0.5065)
Misat5								-0.08065	0.045261	0.874	0.425
								(0.9567)	(1.268)	(1.5)	(0.824)
Trainsat3									0.23315		
									(0.3846)		
Trainsat4									0.66264		
									(0.4934)		
Trainsat5									0.26926		
									(1.476)		
Trainim3				-0.3	0.3635	-0.061	-1.256				
				(0.35)	(0.338)	(0.04865)					
Trainim4				-0.3988	0.437	-0.035	-0.67				
				(0.373)	(0.337)	(0.044)					
Trainim5				-0.34	0.418	-0.0779	-1.455				
				(0.373)	(0.37)	(0.0536)					
Trustsat3								0.68506		0.818	
								(0.5536)		(0.56)	
Trustsat4								1.4138**		1.396**	
								(0.6178)		(0.6)	
Trustsat5								1.0696		2.31**	
								(0.986)		(0.96)	
Trustim3	0.4321**	-0.32885	-0.10332	0.3458	-0.285	-0.064*	-1.21	2.4756**			-2.076*
	(0.2564)	(0.2323)	(0.06904)	(0.31)	(0.2896)	(0.053)		(1.149)			(1.1)
Trustim4	0.3367*	-0.2642*	-0.072*	0.36	-0.26	-0.08998	-1.656	2.5196**			-1.76
	(0.2294)	(0.2176)	(0.012)	(0.318)	(0.289)	(0.0596)		(1.162)			(1.074)
Trustim5	0.10564	-0.078681	-0.05005	0.184	-0.024	-0.159	**2.023	1.856*			-0.63
	(0.2432)	(0.2343)	(0.07427)	(0.39)	(0.382)	(0.0788)		(1.23)			(1.14)
Divsat3								0.40864	0.21239	0.16	
								(0.4073)	(0.3695)	(0.419)	
Divsat4								0.67796	1.8029***	1.63***	
								(0.6515)	(0.4744)	(0.5878)	
Divsat5								0.00434	1.7***	1.705*	
								(0.8417)	(0.7539)	(0.9652)	
Divim3				-0.0166	0.0157	-0.00159	-0.035	-0.36742			-0.32
				(0.23)	(0.249)	(0.031)		(0.7758)			(0.691)
Divim4				-0.335	0.345	-0.01	-0.357	1.2546*			1.23*
				(0.267)	(0.276)	(0.0326)		(0.7245)			(0.7022)
Divim5				-0.455	0.457	-0.00364	-0.022	1.3139*			1.644**
				(0.348)	(0.318)	(0.03784)		(0.8103)			(0.761)
Coopmem	0.434***	0.49***	-0.0558*								
	(0.1663)	(0.1744)	(0.03244)								
Income1								-0.58		1.127***	-0.83**
								(0.3605)		(0.3989)	(0.3672)
Income2								-0.4196		1.15*	-0.54
								(0.35)		(0.65)	(0.584)
Income3								(0.416		0.62	0.6845
								(0.6437)		(0.668)	(0.6617)
Income4								1.5392*		1.73**	
								(0.8053)		(0.809)	(0.7285)
Soysold									1.7873***	2.07***	
									(0.4728)	(0.6555)	
Ricesold									-0.0*****		0.00067
									(0.00176)		(0.0018)
Subdistrict											0.525
											(0.396)
LONGAG1								1.7232**	1.3658***	1.254**	1.767***
								(0.4426)	(0.4036)	(0.4714)	(0.469)
LONGAG2								1.9836**	1.2974***	1.426**	2.01***
								(0.8137)	(0.4474)	(0.63)	(0.629)
EDUC1									-0.0018443		
									(0.4268)		
EDUC2									1.4419***		
									(0.6858)		
EDUC3									-1.4474		
									(0.883)		
HANG								-1.2011**	-1.1374***		
								(0.5885)	(0.5665)		
Onion										1.164*	0.74
										(0.67)	(0.569)
VIII0										0.6385	
										(0.74)	

Variable	Model 1			Model 2				Model 3	Model 4	Model 5	Model 6
	wholesaler	coop	both	wholesaler	coop	Nonpart.	Nonpart.	coop	coop	coop	coop
	Marginal	Marginal	Marginal	Marginal	Marginal	Marginal	T-stat	B coef	B coef	B coef	B coef
Vill1										0.4349	
										(0.639)	
Vill2										0.638	
										(0.702)	
Vill3										0.302	
										(0.64)	
Vill4										-0.58	
										(0.63)	
Vill5										0.348	
										(0.744)	
Vill6										-1.1	
										(1.08)	
Vill7										-2.23**	
										(0.984)	
Vill8										-0.526	
										(0.636)	
Vill9										-1.15	
										(0.82)	
Vill10										0.176	
										(0.91)	
Vill11										0.926	
										(0.85)	
Vill12										2.13**	
										(0.866)	
Mk2								-1.5946			
								(0.9845)			
Mk3								1.705*			
								(0.9687)			
Mk4								-0.996			
								(0.8534			
Mk5								-1.2466			
								(1.086)			
Chi-Sq.		165.107			118.48			169.18	135.8045	149.2748	144.15
(d.f.)		(38)			(36)			(32)	(29)	(39)	(30)
Rho		0.25			0.212			0.364	0.292	0.352	0.340
% correct		0.6953			0.701			0.7794	0.7559	0.828	0.8

Estimated using LIMDEP program
* significant at 95% significance level
** significant at 99% significance level
(d.f.) degrees of freedom

6.5 Results

In light of the values observed using the tabulation tables and an analysis of the data using regression models in Tables 13, 14, and 15, the general results are outlined below.

6.5.1 Binomial Logit Models

The results of the binomial logit models from the regressions outlined in Table 13 (and in Appendix C) indicate that the following variables were highly significant explanatory variables. The direction of the influences are given in brackets. These are coop membership (+), farmer sold soybeans (+), farmer sold garlic (-), sold to the same agent for more than 5 years (+), and sold to the same agent for between 1 and 5 years (+). Variables that were significant included dummy variable coefficients for input satisfaction (+), storage importance (-), location satisfaction (-), marketing information satisfaction (+), trust satisfaction (+), dividends satisfaction (+), two villages (+ & -), and Banmae subdistrict coefficient (+). Other variables that were not significant at 95% significance level or were not very consistent included price satisfaction (+), credit available satisfaction (+), credit charge satisfaction (-), credit charge importance (-), credit available importance (+), time satisfaction (+), grading satisfaction (-), grading importance (+), marketing information importance (+), training satisfaction (+), training importance (+), trust importance (-), dividends importance (indeterminate), income (+ & -), farmer sold rice (indeterminate), farm size (indeterminate), owned/rented (indeterminate), education (+ & -), income (+ & -), marketing agent ratings (+ & -), and several village coefficients (+ & -).

The cooperative membership coefficient COOPMEM was positive and highly significant indicating that farmers who sold to the cooperative were also more likely to be a member of the cooperative. The LONGAG coefficients were positive and significant. The coefficients for LONGAG imply that those farmers who were selling to the same agent for more than five years and between 1 and 5 years were more likely to be selling their produce to the cooperative (intercept

dummy variable was different buyers each year). The farmers who sold soybeans were more likely to sell to the cooperative while farmers who sold garlic were more likely to sell to the wholesalers. The negative coefficient on garlic was as to be expected because the Sanpatong cooperative had only been purchasing garlic for the past year.

The dummy variable on the subdistrict coefficient for the Banmae SUBDIST was positive and significant. This may be interpreted to mean that the farmers from the Banmae subdistrict were more likely to sell to the cooperative than those farmers interviewed from other subdistricts. This could be due to the closer proximity of the Banmae subdistrict to the townsite of Sanpatong (i.e. the cooperative). The coefficients on VILL0 (Appendix C), VILL7, VILL9 (Appendix C), VILL12 for villages in the Banmae subdistrict, were statistically significant. The effect for the respondents in villages of Banmae (VILL0), Roongcon (VILL12) were positive indicating that farmers from these villages were more likely to have sold to the cooperative. For Rongtarl (VILL7) and Simplee (VILL9) this was negative indicating they were more likely to have sold to the wholesalers (farmers outside the Banmae subdistrict consisted of the intercept). The variation between villages could be explained for any of the following reasons: Simplee and Rongtarl townsites are located off the main highway (look to the map on page 34) and therefore farmers may have found it more convenient to sell to the wholesalers; the mayor of the town in Banmae (interviewed by the researcher) had a very positive attitude toward the cooperative and his opinion may have influenced other villagers in the town of Banmae; and the opinions of village leaders may be applicable to other villages.

The coefficient for percentage of land owned (PEROWNED) was positive but not significant. The more land the farmer owned or the less land the farmer rented could not be identified with the farmer also being more likely to sell to the cooperative or the wholesaler.

The price satisfaction coefficients (PRICESAT2 - PRICESAT5) were consistently positive but statistically insignificant. These results were consistent with the prices farmers reported in open-

ended questions that showed little gap in prices given between the cooperative and the wholesalers for soybeans, rice, and garlic. The price importance coefficients were consistently rated very important, PRICEIM5, by either those who sold to the cooperative or those who sold to the wholesalers. However, there wasn't enough variation in the variable's coefficient values to make a concise comparison.

The coefficients CASAT3, CASAT4 on the dummy variables for credit available satisfaction were positive and statistically significant in some regressions while CASAT5 was positive but not significant. The average values from the tabulation table show little difference between the values given by the farmers who sold to the cooperative and the farmers who sold to the wholesalers (0.22). However, the COOPMEM variable regressed as the independent variable with CASAT as the dependent variable was positive and significant. This could mean that those farmers who were members of the cooperative were more likely to be satisfied by the credit made available to them. The coefficients on credit available importance (CAIM2-CAIM5) were positive and statistically significant in some regressions. However, the tabulation table shows little difference between the average ranked value on CAIM from the farmers who sold to the cooperative and the average ranked value on CAIM from farmers who sold to the wholesaler(s) (0.09).

The coefficient CCSAT4 for credit charge was negative and statistically significant in most regressions (CCSAT3, CCSAT5 were negative but were not consistently significant). This may mean that farmers who sold to the wholesalers were more apt to be satisfied with the interest rate on the credit they borrowed from either the wholesalers, BAAC, or the banks than the credit charge from the cooperatives (consistent with the fact that the interest rate at the cooperative was 12.5% and the BAAC and bank were 12%). However, the average values from the tabulation table show little difference between the values given by the farmers who sold to the wholesaler and the farmers who sold to the cooperative (0.08). The coefficients on credit charge importance (CCIM3- CCIM5) were

negative and CCIM3, CCIM4 were significant in some regressions (CCIM5 was not significant). However, the tabulation table shows little difference between the average ranked value on CCIM from the farmers who sold to the cooperative and the average ranked value on CCIM from farmers who sold to the wholesaler(s) (0.02).

The coefficient INPUTSAT5 on the dummy variable for input supply satisfaction was positive and statistically significant (INPUTSAT4 positive but not significant) indicating that the cooperative may to some degree have offered more satisfactory input supply service than those proffered by the wholesalers. The input supply importance coefficients (INPUTIM2 - INPUTIM5) were indeterminate and not statistically significant (Appendix C).

The coefficients LOCSAT4, LOCSAT5 on the dummy variable for location satisfaction were consistently negative and statistically significant (LOCSAT3 was indeterminate and LOCSAT1 and LOCSAT2 were included as the intercept). This would indicate that the farmers who sold to wholesalers were more likely to be satisfied with the location of their agent. This was consistent with the answers farmers had given in open-ended questions in the questionnaire and the fact that wholesalers were often in the same village as the farmers or the fact that wholesalers were willing to pick up the produce from the farmer while the Sanpatong cooperative purchased produce only from the plant site in the townsite of Sanpatong. The coefficients on location importance (LOCIM2-LOCIM5) were indeterminate (Appendix C). The results may indicate that there was little difference in opinion on the importance of location from the farmers who sold to the cooperative and farmers who sold to the wholesalers. The result was somewhat surprising because in open-ended questions location was consistently given as an important factor and many farmers stated that they wished the cooperative would come to the village to buy.

The coefficients for variables on time satisfaction (-), time importance (indeterminate), storage satisfaction (-), grading satisfaction (-), grading importance (+), and training importance (+)

were not consistent and/or statistically significant. These results maybe interpreted to mean that the farmers who sold to either the cooperative or the wholesalers showed little difference on their satisfaction with the subjects of time, grading and training. The coefficient STIM5 on the storage importance variable was negative and statistically significant, indicating that maybe those farmers who sold to the wholesalers were more satisifed with the storage options they had available to them. An interpretation is that this particular variable may have some indirect correlation with the location and time variables. For example, the location and timing of the purchase could influence the farmers' ranking of satisfaction and importance on the storage variable, and vice versa. The tabulation table shows some difference between the average ranked value on STIM from the farmers who sold to the wholesaler(s) and the average ranked value on STIM from farmers who sold to the cooperative (0.25).

The coefficients MISAT3, MISAT4 on the dummy variables for marketing information satisfaction were positive and statistically significant (MISAT5 was insignificant and MISAT2 was included in the intercept). Those farmers who were more likely to be satisfied with the marketing information tended to sell to the cooperative.

The coefficients on TRAINSAT dummy variables for training provided by the market agent were both positive and negative, and not statistically significant. The result would indicate that the farmers in the Sanpatong district did not merit the training satisfaction provided as any different between the market agent choices. However, the average value tabulated in Table 13 for the farmers who sold to the cooperative and those who sold to the wholesalers would suggest that the training provided by the cooperative was more satisfactory. Therefore, there may be a multicollinearity problem or endogeity problem given that the results from the logit regression models and those from the tabulation table were contradictory.

The coefficients TRUSTSAT4, TRUSTSAT5 on the dummy variables for trust of the agent were positive and statistically significant (TRUSTSAT3 was insignificant and TRUSTSAT2 was

included in the intercept). This would indicate that those farmers who sold to the cooperative were more likely to have felt comfortable with their relationship with the agent than those who sold to the wholesalers. The coefficients on the importance of trust (TRUSTIM3 -TRUSTIM5) were negative but not consistently significant (TRUSTIM2 was included in the intercept). The farmers who sold to the wholesalers or those who sold to the cooperatives showed little difference on the importance of trust. The TRUSTIM coefficient results may have been influenced by correlation with TRUSTSAT or DIVIM variables because in the tabulation table, there was a positive difference of 0.32 between the farmers who sold to the cooperative and farmers who sold to the wholesalers. This would suggest that the farmers who sold to the cooperative more highly value trust with the market agent than farmers who sold to the wholesaler(s).

The coefficients on the dividend variables DIVSAT3, DIVSAT4, DIVSAT5 were usually positive and statistically significant (see Appendix C) but correlation problems were prevalent. The positive coefficients indicated that those who sold to the cooperative were more satisfied with dividends than those who sold to the wholesalers. This was consistent with prior beliefs (wholesalers do not issue dividends) but given that dividend satisfaction wasn't highly significant (insignificant in some regressions) there may be reason to believe that the farmers who sold to the cooperative were not highly motivated by the dividends issued by the cooperative. The phenomenon could also be justified by the strong correlation between DIVSAT and COOPMEM or TRUSTSAT (Appendix E). DIVSAT coefficients were positive and highly significant as explanatory variables for COOPMEM. The coefficients on the dividend importance dummy variables (DIVIM2-DIVIM5) were not consistently significant for the choice of a market agent in the binomial and multinomial analysis. However, dividends importance does have an indirect effect through the COOPMEM variable when interaction effects were tested (positive and highly significant). There was high correlation between the DIVIM variable and other variables included in the modeling (see Appendix E). Moreover, the

DIVIM coefficients appeared to highly favour the cooperative in the tabulation table. Those farmers who sold to the coooperative, in general, valued dividends more importantly than those who sold to the wholesalers.

6.5.2 Farmers' and Managers' Comparison Using a Tabulation Table

The values from the sub-table of the Sanpatong manager's perceptions in Table 12 seem to complement with the results from the regressions in Table 13 with a few exceptions. The manager's outlook on the satisfaction and importance of the variables differ by more than one ranking for the values (in the brackets, positive if manager's view ranked higher and negative if vice versa) for the variables PRICESAT (-), INPUTSAT (+), CASAT (-), CCIM (+), LOCSAT (+), STIM (+), MIIM (-), TRAINSAT (+), and TRUSTSAT (+). The values would tend to indicate that the farmers were either more satisfied or less satisfied with the cooperative than the manager of the cooperative comprehended. For example, the farmers were more satisfied with the price and credit available than the manager fully perceived while the farmers were less satisfied with the input supplies, location, training received, and their general trust of the cooperative than the manager of the cooperative discerned. The cooperative manager undervalued the importance of market information to the farmers who sold to the cooperative while overstating the importance of interest rates, and storage to farmers who sold to the cooperative. The results would suggest that the cooperative manager understood many of the concerns farmers had implied by their motives or actions demonstrated in their marketing, however, the manager may have misread some other important differences in perceptions the farmers indicated by their actions.

5.6.3 Multinomial Logit Models

In the multinomial models from Table 13 (and Appendix D), it can be also observed that the significant coefficient values for the variables on the choice of cooperative remain significant and the relative values have not substantially changed. However, most of the coefficient values on the choice for both the cooperative and wholesalers were consistently insignificant with the exception of coefficient values for variables TIMESAT (+) , LOCSAT (-), TRUSTIM (-), COOPMEM (-), and CASAT (-).

The coefficient values for the variable TIMESAT (TIMESAT4, TIMESAT5) on the choice of both the Sanpatong cooperative and wholesalers were consistently significant and positive (see Table 14, model giving the marginal probabilities). This could be interpreted to mean that those farmers who choose to sell to both the wholesaler and the cooperative were generally more satisfied with time it took to sell their product. The values from the tabulation table, Table 12, may also have indicated that these same farmers judged the importance of time more strongly than other farmers.

The coefficient values for the variable for LOCSAT (LOCSAT3 - LOCSAT5) on the choice of both were negative and statistically significant. The values may indicate that those farmers who sold to both agents were not as satisfied with the location as those farmers who either sold to the cooperative or the wholesalers. This result may have been due to the fact that some farmers had to take their agricultural produce to more than one marketing agent because the agent either rejected some of their product (i.e poor quality) or the farmer had more than one agricultural product to sell. This interpretation would coincide with some of the answers given by farmers in the open-ended questions, which had either stated their product was rejected because of poor quality or inadequate space at the plant.

The coefficient values on the variable TRUSTIM (TRUSTIM3-TRUSTIM4) on the choice of both the cooperative and wholesaler(s) were negative and statistically significant in some

regressions. The results may suggest that those farmers who choose to sell to both agents did not value the trust of the chosen agent as important as the other farmers. This result was quite rational and would concur with the prior expectations.

The coefficient value for the variable COOPMEM was negative and significant on the choice of both (see Appendix D), using the marginal probabilities as a measure of significance. The outcome may have implied that those farmers who sold to both agents were less likely to be members of the Sanpatong cooperative than those who sold to the cooperative. The results may however not apply for those who sold to the wholesalers because the β coefficient value on choice of both the cooperative and wholesaler(s) was positive and insignificant for the choice utilizing wholesalers as an intercept value.

The coefficient values for the variable CASAT (CASAT3-CASAT4) on the choice of both were significant and negative (see Appendix D). The negative values on the choice of both may have revealed that those farmers who choose to sell to the cooperative and the wholesalers, were less satisified with the credit made available than farmers who sold to either the cooperative or the wholesalers. The outcome would seem reasonable because farmers may had difficulty securing a loan from the cooperative (or another lending agent) if they didn't consistently sell their produce to the cooperative (or to another particular agent).

6.5.4 Order Probit and Censored Tobit Models

The inclusion of variables valuing satisfaction may be indirectly endogeneous because the values were ranked by each farmer on the perception of the agent he/she dealt with. The ordered probit models or the censored tobit models may provide a means to evaluate the attributes from a regression using either AGENT and COOPMEM as one of the independent variables and either PRICESAT or some other satisfaction variable as the dependent variable. In Table 14, the variables

PRICESAT, INPUTSAT, CASAT, CCSAT, TIMESAT, GRADSAT, MISAT, TRAINSAT, TRUSTSAT, and DIVSAT are the dependent variables each regressed with the a set of independent variables such as COOPMEM, AGENT, LONGAG, SOYSOLD, RICESOLD, GARLICSOLD and AGE. The results from Table 14 indicated that the PRICESAT variable was not significantly different for farmers who sold to the cooperative and farmers who sold to the wholesalers. The other satisfaction variables with the exception of CASAT, CCSAT, and TRAINSAT appeared to be consistent with those results from the binomial logit results in Table 13 and the results from multinomial logit models in Table 13. The censored tobit model results in Table 14 found the AGENT variable positive (negative) but statistically insignificant when regressed as an independent variable with the CASAT (CCSAT) as the dependent variable. The censored tobit model also found that using the TRAINSAT as the dependent variable and AGENT as the independent variable indicated that the cooperative was positive and significant. Those farmers who sold to the cooperative were more likely to be satisfied with the training provided.

5.6.5 Nonparticipation Model

In Table 15, model 2, the variable choice for nonparticipation was combined to find out if farmers who chose not to sell their farm produce had different perceptions from those farmers who either sold to the cooperative or the wholesalers. The values from the tabulation table would suggest that those farmers who chose not to sell their agriculture produce were generally less satisfied with all the product attributes of the organizations. However, the values from the multinomial model that incorporated importance attributes found that the coefficient values for each of the variables were not statistically different than those of the farmers who sold to either the cooperative or the wholesalers. In model 2, the only variable with a significant marginal probability value was trust importance, TRUSTIM5, indicating that nonparticipants valued trust somewhat less than those who

sold agriculture produce to either the cooperative or the wholesalers.

5.6.6 HangDong District Model

In Table 15, there are two models, models 3 and 4, that have included the observations from the HangDong district with those from the Sanpatong district. A dummy variable (0 or 1) was used to distinguish the observations from the HangDong district and those from the Sanpatong district. Combining the two districts did not change the values of the coefficients but the added coefficient value, the HangDong dummy variable, was negative and significant. The negativity and significance of the dummy variable on the HangDong district indicates that those farmers from the HangDong district were more likely to sell to the wholesalers than those from the Sanpatong district. However, in awareness of the small sample from the HangDong district, unequivocal assertions pertaining to the farmers' perceptions should not be ascertained. The values of the coefficients could not be rigorously examined using logit analysis with such a small sample but the tabulation table did provide some indication of the differences between the farmers' perception of the cooperative and the wholesalers; and those between the HangDong cooperative and those from the Sanpatong cooperative. The average rating from those who sold to the HangDong cooperative was significantly[17] higher than the wholesalers in the HangDong district for the following variables (difference in brackets): INPUTSAT (0.47), CASAT (0.37), STIM (0.28), GRADIM (0.37), TRAINSAT (0.28), TRUSTSAT (0.57), DIVSAT (0.84), and INCOME (0.58). The average rating from those who sold to the wholesalers in the HangDong district was significantly higher than the HangDong cooperative for only one variable, TIMESAT (0.25).

The differences between the perceptions from the farmers in both districts who sold to a cooperative must be interpreted with caution. The variable ratings were obtained by rankings

[17]The subjective value defined as significant is the difference between the average rating for the cooperative and the wholesalers of 0.25.

conducted by different interviewers and each interviewer could have had shown some of their own bias when interviewing.[18] However, there was evidence that the average income level for farmers in the HangDong district was higher than average income level in the Sanpatong district, with those farmers who sold to the HangDong cooperative having the highest income level of those interviewed.

In Table 12, the HangDong managers' point of view and the farmer's perspective differ by more than one ranking for the following variables. In the brackets, a positive sign is given if managers' view ranked higher than the average ranking by the farmers interviewed and negative sign if the managers' view was lower than the average ranking by farmers interviewed. These variables are PRICESAT (+), INPUTSAT (+), CCIM (+), GRADEIM (+), GRADSAT (-), MISAT (-), and DIVSAT(+). The differences would suggest that farmers were either more satisfied or less satisfied with the cooperative than the managers of the cooperative understood. For example, the farmers were more satisfied with the grading and market information than the managers fully thought while the farmers were less satisfied with the price, input supplies, and dividends than the managers of the cooperative grasped. The cooperative managers overstated the importance of the interest rate and grading than what had been expressed by the farmers interviewed.

5.6.7 Onion Cooperative Model

In Table 15, models 5 and 6, onions are included as a dummy variable in model set where the farmer has a choice of either the cooperative or a wholesaler. All the observations from the Sanpatong district who sold to either a cooperative (Sanpatong cooperative or the Banuk 'onion' cooperative) or a wholesaler are thus included. Combining the observations from the two cooperatives has not substantially changed the values of the coefficients but the 'onion product' coefficient was positive and significant. The dummy variable on the 'onion product' would indicate

[18]The conclusions from the comparison of the values from each interviewer would indicate some unexplained variation or bias

that farmers who sold onions were more likely to sell to the cooperative than farmers who sold other products in the Sanpatong district. In regard to the small sample of farmers who sold onions in the Sanpatong district, the results should be interpreted with discretion.[19] The values of the coefficients from the tabulation table provide some indication of the differences between the farmers' perception of the Banuk 'onion' cooperative and the wholesalers. The average ratings from those who sold to the onion cooperative were significantly[20] different than the wholesalers in the Sanpatong district for the following variables (difference in brackets, positive in favour of the coop, negative in favour of the wholesalers): PRICESAT(-0.35), CASAT (+0.29), MISAT (+0.43), DIVSAT (+0.45), and INCOME (+0.9).

6.6 Summary

The data analysis from the tabulation table, and the econometric analysis, identify some significant points of rationale about how the farmers make their decisions concerning the selling of their agricultural produce to prevalent organization(s). The more substantial issues discussed in the study pertain to the questions involving the differences in the farmers' views of the attributes or characteristics of the different organizations. The outcome from the data analysis would show that there are several key differences in the attributes concerning each of the organizations. The cooperative, in comparison to the wholesalers, appeared to provide more satisfactory input supplies to the farmers, an alternative option for credit, be more likely to proffer market information, be perceived as moderately more sincere, and provide the option of getting dividends. The wholesalers

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[19]The variable rankings for the Banuk 'onion' cooperative were not isolated from the values given to the Sanpatong cooperative. In other words, some of the farmers sold to both cooperatives (and were members of both cooperatives). As consequence, while the manager's and the farmers' perceptions may be compared in Table 12 by inspection , it may be misleading to provide any conclusions.

[20]The subjective value defined as significant is the difference between the average rating for the cooperative and the wholesalers of 0.25.

were found to provide similar services to the farmers for those variables not mentioned above with one significant exception. The wholesalers, in comparison to the cooperative, were found to provide a more agreeable location of purchase. However, the farmers did not indicate significantly different rankings for the importance of any of the variables depending on whether the farmer sold to the cooperative or the wholesaler with the exception of dividends and storage availability. The results did find that farmers in general were inclined to value some of the attributes as more important than other attributes. For example, farmers ranked price, input supply, location of purchase, timing of purchase as the most important variables (average ranking over 4).

The study determined that the choice of the market agent was often preconditioned on several different factors. The most significant factor involved in the choice of whom the farmer sold to was the agricultural produce being sold. For example, farmers in the Sanpatong district who sold soybeans or onions were more likely to sell to the cooperative than the wholesalers. In contrast, for now those farmers who sold garlic were more likely to sell their product to the wholesalers than the cooperative. Rice was insignificant in the choice of the market agent. There was also some indication from the data that the village the farmer was from, and the number of years sold to the same agent, influenced the choice of the marketing agent. The data provided some evidence that farmers from some of the same villages were often inclined to sell to the same agent. There was also evidence that farmers who sold for more than one year to the same agent were more likely to have sold to the cooperative. The ramifications of this conduct would indicate that farmers' past experience is consequential in the decisions they will make hereafter. Farmers who sold to the cooperative will likely continue to sell to the cooperative while farmers who sold to the wholesalers may or may not continue to sell to the wholesalers. The habit forming behaviour of farmers who sold to the cooperative could be a sense of loyalty of the cooperative members or it could perhaps be for other reasons such as credit or input supply commitments. Another general conclusion from the results was

that farmers who sold to both the agents discern time as a necessary factor that could not have been met by a single agent choice. The farmers choose to sell to both the cooperative and wholesaler(s) because of time constraints. The nonparticipant farmers were found to place the same meaningfulness on the different aspects of the organizations as the farmers who sold agricultural produce but were much less satisfied with the worth of the attributes being made available. The comparison of the two cooperative organizations in each of the districts show slight differences in how the farmers perceive them in context to the wholesalers in the districts. The deviations between the cooperatives are visible in the tabulation table but are not further elaborated on in this study due to some limitations that were discussed before. The cooperative managers' perceptions of their organizations and the perceptions of the farmers differed substantially on some important factors. There were some significant elements about the services the cooperatives misjudged from the opinions expressed by the farmers in the interviewing. The farmers in the Sanpatong district were less satisfied with input supplies, location, training received, and in their general trust of the cooperative than the Sanpatong manager either indicated or understood when the interview was conducted. In the HangDong district, the farmers were less satisfied with the price, input supplies, and dividends than the managers of the cooperative fully comprehended.

VII Summary, Conclusions, and Recommendations

7.1 Findings of the Study

The performance of cooperatives in Thailand is evaluated in context to previous documented research on cooperatives in Thailand and the empirical analysis of the Sanpatong and HangDong cooperatives as presented within this study. It is the intent of this chapter to reiterate the most important issues addressed and from the analysis of the data collected on the Sanpatong and HangDong cooperatives make conclusions concerning these issues.

The first issue concerns the differences farmers have in perceptions of the cooperative organizations and the other rival agents in the market. The performance of the Sanpatong cooperative, HangDong cooperative, and the Banuk 'onion' cooperative are evaluated in relation to their outcome from the empirical analysis in comparison to their counterparts, the wholesalers. The results from the data analysis indicates that the cooperative may offer the farmers in the Sanpatong and HangDong districts a better market agent choice for certain attributes while the wholesalers may also offer other attributes that are preferred by the farmers in the two districts. The results suggest that farmers valued the cooperatives more favourably for such attributes as input supplies, market information provided, the general trust of their market agent, and the dividends given out while the wholesalers are preferred for attributes concerning convenience such as the more accessible locations of purchase. However, the results did not find that farmers who sold to the cooperative or farmers who sold to the wholesalers were significantly more inclined to value any of the attributes as more important to them than the other market agent choice(s) with the exception of dividends and storage availability. Farmers who sold to the cooperative were more inclined to rank dividends as more important than farmers who sold to the wholesalers. Farmers who sold to the wholesalers were more inclined to rank storage availability as more important than farmers who sold to the cooperative.

The second issue dealt with how farmers choice of market agent changed between the

cooperative and the wholesaler depending on the agricultural product sold. The outcome from the data analysis indicated that farmers selling soybeans or onions were also more likely to sell to the cooperative while those who sold garlic were more likely to sell to the wholesalers for now. It was the first year the Sanpatong cooperative purchased garlic from the farmers in the district. The data from the two districts also indicated that farmers were indifferent to who rice was sold to. This issue may have important implications for cooperatives if farmers happen to diversify their agricultural products away from rice. In other words, the farmers' choice of market agent may change depending on which agricultural product(s) farmers produce. Therefore, the Sanpatong and the HangDong cooperatives may have the potential to expand their market share if soybeans or onions were to become more popular to grow in the two districts.

The third issue has addressed the different views the managers of the cooperatives and the farmers in the two districts have concerning the attributes encompassed by each of the market agent choices. These attributes, where the managers' and farmers' views have decisively differed, are to do with the farmers satisfaction with price, input supplies, location, training provided, trust of the cooperative, and dividends. The farmers were less satisfied with each of these attributes than either the Sanpatong or HangDong cooperative managers acknowledged or recognized at the time when the interview was conducted.

The fourth issue considers how the cooperative organizations may help increase agricultural productivity, and improve the farmers' bargaining power in marketing their farm products. The documented research on cooperatives in Thailand suggested that cooperative organizations have made some progress from a historical perspective but the improvements have been quite sporadic and costly in terms of the finances and resources that have come from the Government of Thailand. The achievements in improved profitability, loan repayment, and efficiency of the organizational structure of the cooperatives can be exemplified by cooperatives such as the Sanpatong and HangDong

cooperatives in Northern Thailand. The empirical analysis of these cooperatives from the perspective of the farmers have shown that cooperatives in Thailand have the potential to provide certain attributes better than alternative organizations such as private wholesalers. For example, the results as discussed earlier had shown that the Sanpatong and HangDong cooperatives enhanced the market from the farmers perspective and had achieved these improvements without financial support from the government. Cooperative theory discussed in an earlier chapter also showed how the cooperatives have the potential to help farmers achieve better terms of bargaining with concern to prices, services and loan opportunities. However no data was collected from a district without a cooperative to make a comparison, and therefore the information about how cooperatives may improve bargaining power for farmers could not be discerned.

The final issue to confront concerns whether or not multipurpose cooperatives better serve the needs of the farmers in contrast to cooperatives that have a single function. Cooperative theory in an earlier chapter discussed the advantages and the disadvantages of either multipurpose cooperatives or single function cooperatives but according to theory neither cooperative structure was defined as a clear winner. However, literature documented on agriculture cooperatives in Thailand have strongly implied that multipurpose cooperatives have had a better overall performance than that of the single-purpose cooperatives. The data from the Sanpatong and HangDong districts seems to corroborate the statement above. The results from the empirical analysis suggests that farmers highly value all the attributes of the multipurpose cooperatives and like the convenience of selling to the same agent from whom they also get input supplies and credit.

7.2 Recommendations

The findings in the previous section could have significance for those involved in agriculture and policy implementation in Thailand. The farmers in Thailand, particularly those farmers from the

Sanpatong and HangDong districts, may have a purpose with the information as concerns the decision of who they may best choose to market their agriculture produce, get input supplies from, and borrow finances from. For example, the farmers could use the results from the study to make the choice of the market agent that best meets their needs for their particular circumstances. The information could be used by the cooperative organizations such as the Cooperative League of Thailand (CLT), Agricultural Cooperative Federation of Thailand (ACFT), and in particular, the Sanpatong and HangDong cooperative management. These organizations may want to model other cooperatives from the example of the Sanpatong and HangDong cooperatives. The cooperatives, including Sanpatong and HangDong cooperatives, may find new insight into how they could improve their performance and better serve the needs of their members. The information could also be used by policy makers and those who implement policy. Extension officers may find the information quite useful in trying to determine the most appropriate methods to solving the problems for agriculture in Thailand. University academics may utilize the information in further research of cooperatives in Thailand or other developing countries. Finally, perhaps most importantly, the policy makers from the Government of Thailand may use the results when planning future policies concerning rural agriculture and/or cooperative organizations. For example, the study outlines how cooperatives have provided some unique characteristics not provided by the wholesalers.

To reiterate, the market structure in the Sanpatong and HangDong districts in their present form consists of several choices for marketing the farmer's produce, obtaining credit for short term and intermediate needs, and offering diverse sources of input supply. As such, the market effectively provides the primary needs of the farmers in the Sanpatong and HangDong districts with no need for fundamental change. The farmers in both districts appear to be relatively satisfied with the market, and the wholesalers and the cooperatives offer a complementary array of beneficial needs to the farmers. However, some farmers would like to see some modifications in the current composition

of the organizations. For example, the results from the data analysis suggest that farmers likely want more training and market information made accessible, the cooperative should consider providing a transferral of the agricultural produce from the village sites to Sanpatong as a rudimentary service, and a need for more explanation to farmers about the pricing and other services.

In general, the essential services offered by the cooperative or wholesalers may be only expected to marginally improve under the present circumstances prevalent in Northern Thailand. It is the researcher's opinion that improvements in the services provided to farmers is directly associated with basic education in rural regions. The system or structure of the market can only improve if the farmers are better equipped with the skills they will need for adoption of new farm methods and new technology. While the cooperatives should become actively involved in the process of change in agriculture, the predominant force in the improving the plight of rural farmers will directly involve the government.

7.3 Limitations

The study conducted in this thesis provides meaningful information that may be relevant for further study, and decision making by the farmers, the cooperatives, the Government of Thailand and the others cited before. However, there are several limitations in the scope and depth of the study that need to be fully understood by those who may use the information. The first limitation concerns the data collection and the second limitation about the method of data analysis.

The data was collected by using an arbitrary method based on ranking utility amongst different farmers in only two districts in Northern Thailand. The information only concerned two multipurpose cooperatives (and an onion cooperative) that are generally considered to typify the more successful cooperatives in Thailand (may not apply to the onion cooperative). The sample size from the HangDong district, and the samples associated with the onion cooperative, were small

representations of all the farmers. Moreover, the collection process may have involved some small discrepancies not accounted for by the variables studied or due to researcher error.

The analysis of the data was done by using a cross tabulation method and a simple version of the random utility model. While the models may provide an accurate account of the data there are several flaws or difficulties associated with their use. For example, the tabulation table is too simple to identify anything more than the obvious while the random utility model is based on several weak assumptions extensively discussed by Ben-Akiva and Lerman (1993) and Maddala (1989). Furthermore, the random utility model used in this study doesn't incorporate attributes specific to each of the organizations. By not including characteristics specific to each of the organizations the model may be incomplete. As well, there are several different options available to each of the farmers that cannot be precisely identified in this random utility model. There are a multitude of choices facing each farmer that is unique to the farmers desired set of criteria or needs. For example, the farmer (member or nonmember) may choose to sell his/her rice to the cooperative, his/her soybeans to the village wholesaler, borrow money from the bank, buy inputs from the market in Chiang Mai and so on. The random utility model utilized in this paper does not capture the full impact of these different intricacies. However, another approach based on similar principles, the nested logit model, can be adapted to suit the hierarchical structure of decision making as outlined above. This method wasn't implemented because of the computational difficulty involved. For further reference to the nested model the reader is referred to Ben-Akiva and Lerman (1993) or Maddala (1989).

7.4 Implications for Further Study

The framework of study could be extended in several different directions to obtain other purposeful information that the research is this study did not address. For example, the existing data could be used to analyze the indirect effects between different variables such as dividends and age,

income and education, and so on. Other interesting studies beyond the reach of this study could confront issues involving welfare measurements for the impact of changes in the market. For example, a more elaborate random utility model incorporating specific organization or site substitution attributes could measure the impact of a closure of the cooperative or the withdrawal of a service from the cooperative. The welfare measures could also be extended to analyze several different aspects that could not be tested in the empirical analysis of this study. The most important of these is whether or not the multipurpose cooperatives are viewed as an improvement in the performance of the cooperative. Another approach would be to compare the different locations where there are cooperatives, to those without cooperative organizations, to evaluate the differences. For example, the differences examined may include price, credit made available, interest rate, and so on, to determine whether or not having the cooperative significantly alters the existing market structure. The results from the study may also provide a basis upon which further insight can be extended into research comparing profitability, asset turnover, leverage factors, return on assets, and return on net worth, and so on.

7.5 Concluding Statements

In conclusion, the data from the analysis shows that the cooperatives have a purpose in the Sanpatong and the HangDong districts. The cooperatives provide a viable alternative for farmers to choose from in marketing their produce, getting input supplies, and obtaining credit. In other words, the cooperatives achieve an improvement in several services beyond those offered by the wholesalers. The wholesalers, however, provide some other services prefered to those offered by the cooperative. Therefore, it appears that the Sanpatong and HangDong district farmers are best served by having a competitive environment where both the wholesalers and the cooperatives are competing for the farmers' loyalty.

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Appendix A: Farmer's Questionnaire

Farmers Questionaire

Questionaire no.

Name:

Village: **Name of Interviewer:**

Date of Interview:

Personal Demographics:

Sex:
Age:
Family Size:
Education:

Annual Income in baht:

20,000 or less _____ **40-50,000** _____
20-30,000 _____ **50,000**
30-40,000 _____ **or more** _____

Farm Demographics:

Farm Size:_____ **rai** **Owned:**
Rented:

Cropping information for the past year:

crop	No.rai
rice	
soybeans	
onions	
garlic	
other	

Crop production and use for the past year:

crop	total production	consump-tion	seed	livestock use	sold
rice					
soybeans					
garlic					
onions					
other					

Marketing Demographics:

1. In the past year, who was your buyer(s) of rice?

Who bought your other farm products?

2. Are you a member of a cooperative or cooperatives?

How many years a member of the cooperative?

3. If no, have you been a member of a cooperative?

How many years have you sold to your present buyer?

4. When was the rice sold to the buyer?

When were the other farm products sold?

5. Where did you sell your rice?

Where did you sell your other farm products?

6. Was your farm products transported?

How were they transported?

How much did it cost?

7. What price was received for the rice?

What prices were received for the other farm products?

8. Were other prices offered by the other buyers? What were the other prices offered?

9. **If a cooperative, were dividends issued? How much?

10. Does the marketing agent provide market information?

How do you get market information?
For example
i) general info
ii) radio
iii) newspaper
iv) info from the market agents
v) T.V.
vi) extension officiers
vii) contact farmers, etc...

11. Does the market agent provide any training? Such as managerial training, crop production training, fertilizer and chemical use, etc..?

12. Are you satsified with the market info and training received from the marketing agent? Why or why not?

13. Does the market agent provide inputs such as chemicals, fertilizers, seed, etc..?

Does it provide credit for these products?

What is the credit arrangement?

14. Did you receive credit for your product?

How much credit?

What interest rate?
How long?

Did you get any other credit?

15. Do you have your own storage facilities?

Did you you have to store the product(s)? How long?

or

Did the market agent provide storage?

Was there a cost?

16. Was the rice graded?

How was the rice graded?

Were you satisfied with grading?

Were the other products graded?

How were your other produccts graded?

Were you satisfied with the grading?

On a 1-5 ratio of importance, rate the following:

5 is most important, 1 is least important

	Not Important				Important
Price	1	2	3	4	5
Inputs supplied by the market agent	1	2	3	4	5
Credit availability	1	2	3	4	5
Credit charge	1	2	3	4	5
Location or transportation	1	2	3	4	5
Timing of purchase	1	2	3	4	5
Storage	1	2	3	4	5
Grading	1	2	3	4	5
Market information	1	2	3	4	5
Training	1	2	3	4	5
Trust	1	2	3	4	5
Dividends	1	2	3	4	5

On a 1-5 ratio of the satisfaction for the past year, rate the following:

5 most satisfaction, 1 least satisfaction

	Not Satisfactory				Satisfactory
Price received for product(s)	1	2	3	4	5
Inputs supplied by the market agent	1	2	3	4	5
Credit availabilitity	1	2	3	4	5
Credit charge	1	2	3	4	5
Location or transportation	1	2	3	4	5
Timing of purchase	1	2	3	4	5
Storage	1	2	3	4	5
Grading	1	2	3	4	5
Market information	1	2	3	4	5
Training	1	2	3	4	5
Trust	1	2	3	4	5
Dividends	1	2	3	4	5

9. On a 1-5 ratio of willingness, rate the following:

5 is most willing, 1 least willing

Pool your money for credit purposes within your village

not willing				willing
1	2	3	4	5

Pool your resources of labour and time to improve marketing of your farm products in your village

not willing willing

1 2 3 4 5

20. Are you satisfied with the present marketing structure?

21. What do you like or dislike about your marketing agent?

Why?

What would you change?

22. On a 1-5 ratio, rate your marketing agent or agent(s)
5 is best, 1 is worst

bad good

1 2 3 4 5

23. Who do you prefer to sell to
i) cooperative
ii) private agent or wholesaler
iii) government
iv) directly to the consaumer

Why?

24. Do you have any changes you are planning? What are they?

Thankyou.

Appendix B : Market Agent's Questionnaire

Marketing Agent(s) Questionaire

Market Agent:
Name of the person interviewed:
Town site of the plant:
Date of interview:

1. How many years old is the cooperative?

2. How many members or customers do you have?

3. Is the cooperative expanding? By how much?

4. How many employees work at this cooperative?

5. How can you become a member or sell to this cooperative?

What rules and regulations do you have to be a member or to sell to this cooperative?

6. What is the area to which your cooperative purchases agricultural produce from?

7. What agricultural products do you buy from the farmers?

8. How are each product graded or what criteria do you use in grading?

Do you think farmers understand your grading method?

Do you think the method of grading is satisfactory to the farmer?

9. What are the prices for each of the farm products bought according to their grade (today's price)?

10. How do the prices for these agriculutral products vary in the year?

How do your prices compare to those offered by other market agents?

11. When are farmers paid for the agricultural products?

12. Do you sell inputs to the farmers? What inputs do you sell to the farmers?

13. Do you offer credit for the purchase of these inputs?

What is the credit arrangement?

Do you offer cash credit to the farmer?

How much?

What interest rate?

How long?

14. Does the company borrow money?

What are the terms you borrow at?

Who do you borrow from?

For example, the bank, government, farmers, marketing board.

15. Do you get your inputs on any credit? If so, what are the terms?

16. Do you transport products from the farm to the plant?

If so, what are the terms of trade? For example, the distance, volume, and the cost to the farmer?

17. Do you purchase agriculutral produce from the farmer at the plant?

18. Are the products further processed at the plant before shipment?

What processing is done?

19. Where are the products then shipped to?

How are they transported?

What are the costs added to processing and transportation?

20. Do you provide stoprage to the farmer at the plant or other locations?

What are the terms?

21. Do you have storage at the plant?

How long can you store your product?

22. What prices do you sell your products at?

23. Do you provide the farmer market info?

What market info do you provide?

How do you provide them info?

24. Do you provide the farmers training?

What kind of training do you provide?

How do you provide them training?

Do you think they are satisfied?

25. What other services do you provide the farmers?

26. Is the cooperative profitable?

27. What do you do with the profits?

28. How are the dividends distributed? How much?

29. Do the farmers make payment on their credit on time?

Are you satisfied with their effort to pay for credit borrowed?

30. Do the farm products come to the plant at the appropriate time or do the farmers not supply the products when needed at the plant?

31. Is the quality of the product satisfactory to the plant? For example, the rice meets the quality standards for moisture content, cleanliness, and disease?

How could the product be improved?

32. Are the farmers willing to cooperate and learn so as to improve their products?

Are the members loyal to the cooperative?

Are the farmers knowledgable enough to make the changes needed?

33. Are you satisfied with the market structure?

If not, what problems persist in the market?

How could the market be improved?

Rate the importance of the following on a 1-5 ratio

5 is very good, 1 is very bad

	bad				good
Price	1	2	3	4	5
Inputs upplied by the market agent	1	2	3	4	5
Credit availability	1	2	3	4	5
Credit charge	1	2	3	4	5
Location or transportation	1	2	3	4	5
Timing of purchase	1	2	3	4	5
Storage	1	2	3	4	5
Grading	1	2	3	4	5
Market information	1	2	3	4	5
Training	1	2	3	4	5
Trust	1	2	3	4	5
Dividends	1	2	3	4	5

Rate the service you provide to the producers according to the following on a 1-5 ratio:

5 is the best, 1 is the worst

	bad				good
Price	1	2	3	4	5
Inputs supplied by the market agent	1	2	3	4	5
Credit availability	1	2	3	4	5
Credit charge	1	2	3	4	5
Timing of purchase	1	2	3	4	5
Convenience of sale	1	2	3	4	5
Storage	1	2	3	4	5
Grading	1	2	3	4	5
Market information	1	2	3	4	5
Training	1	2	3	4	5
Trust	1	2	3	4	5
Dividends	1	2	3	4	5

What changes do you have planned for in the future?

Thankyou.

Appendix C : Binomial Models

Binomial Logit Models

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
Variable	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef
Constant	-83.4	-0.3	-94.5	-15.0	**-3.7745***	-0.7	**-3.2756****	**-4.67****	-17.3	-2.9	**-3.728****
(S.D.)	(1674)	(1.666)	(1702)	(195)	(0.9431)	(2.222)	(0.8918)	(1.444)	(191)	(2.139)	(1.024)
Pricesat2	-0.9		0.6					1.0	1.1		
	(1.993)		(2.14)					(1.13)	(1.317)		
Pricesat3	-0.4		1.4					0.9	1.6		
	(2.054)		(2.162)					(1.12)	(1.31)		
Pricesat4	-1.2		0.4					0.4	1.0		
	(2.126)		(2.181)					(1.137)	(1.316)		
Pricesat5	-2.8		-1.3					-1.1	-0.2		
	(2.539)		(2.41)					(1.268)	(1.494)		
Inputsat3	0.4	0.1	0.0	0.4				0.0	0.2	0.1	
	(0.8602)	(0.5717)	(0.6941)	(0.5391)				(0.4669)	(0.5679)	(0.4648)	
Inputsat4	1.1	0.4	0.5	0.3				0.8	0.3	0.4	
	(0.9842)	(0.6082)	(0.7802)	(0.5948)				(0.5224)	(0.6507)	(0.4948)	
Inputsat5	**4.415****	**2.306****	**3.78****	1.6				**2.425****	**2***	**1.76***	
	(1.835)	(1.151)	(1.548)	(1.018)				(1.03)	(1.121)	(1.015)	
Inputim3	-3.3		-2.8								
	(3.015)		(2.463)								
Inputim4	-3.2		-2.3								
	(2.748)		(2.254)								
Inputim5	-2.7		-2.1								
	(2.784)		(2.292)								
Casat2	3.0		1.8						1.5		
	(1.874)		(1.557)						(1.142)		
Casat3	**4.18****	**1.70****	**3.543****	**1.029***	**1.073****	**1.587****			**2.43****		
	(1.9)	(0.6923)	(1.543)	(0.6231)	(0.5392)	(0.6652)			(1.085)		
Casat4	2.9	0.2	2.2	0.8	**1.337***	0.6			**1.956***		
	(1.885)	(0.7069)	(1.496)	(0.6212)	(0.5566)	(0.7231)			(1.061)		
Casat5	2.2	0.0	1.6	0.1	0.6	-0.01014			1.5		
	(2.098)	(1.043)	(1.694)	(0.911)	(0.7988)	(0.9865)			(1.25)		
Caim3	6.6	1.9	**4.163****			2.0					0.3
	(2.463)	(1.219)	(1.81)			(1.244)					(0.6856)
Caim4	3.8	2.0	**3.019***			1.6					**1.06****
	(2.311)	(1.219)	(1.78)			(1.226)					(0.6439)
Caim5	2.4	1.0	1.7*			0.5					0.5
	(2.386)	(1.32)	(1.793)			(1.308)					(0.6894)
CCsat2	-0.4		-0.7						-1.3		
	(1.602)		(1.389)						(1.002)		
CCsat3	-2.4	-0.8	-2.1	-0.5	-0.4	-1.2		-0.2	**-1.686***	-0.2	0.2
	(1.695)	(0.6419)	(1.36)	(0.5957)	(0.5021)	(0.643)		(0.4258)	(0.9658)	(0.4304)	(0.4241)
CCsat4	-3.0	**-1.78****	**-2.689***	**-1.451****	**-1.246****	-2.0		-0.8	**-2.373****	**-1.007***	-0.2
	(1.837)	(0.7811)	(1.473)	(0.6846)	(0.5961)	(0.8121)		(0.5252)	(1.024)	(0.5374)	(0.51)
CCsat5	-2.7	-1.3	-2.1	-1.1	-0.5	-1.3		-0.5	-2.1	-0.8	-0.5
	(2.071)	(1.26)	(1.9)	(1.135)	(1.043)	(1.24)		(0.896)	(1.416)	(0.8817)	(0.8563)
CCim3	**8.0****	-2.5*	**-4.2****			**-3.28****					
	(2.54)	(1.333)	(1.732)			(1.364)					
CCim4	**-7.328****	-2.1	**-3.42****			**-2.7***					
	(2.601)	(1.363)	(1.761)			(1.39)					
CCim5	**-5.35****	-0.6	-1.6			-1.4					
	(2.588)	(1.363)	(1.818)			(1.493)					
locsat3	-0.2	-0.4	-0.3			-0.3	0.4	0.3		0.1	0.2
	(0.9053)	(0.6549)	(0.7788)			(0.6623)	(0.5186)	(0.503)		(0.5233)	(0.4924)
locsat4	-1.5	**-1.38****	-1.3			**-1.427****	**-1.05****	-0.8		**-0.97***	-0.7
	(0.9937)	(0.6663)	(0.7928)			(0.6692)	(0.528)	(0.5131)		(0.5314)	(0.491)
locsat5	**-3.6****	**-2.7****	**-3.05***			**-3.064****	**-1.7****	**-1.759****		**-2.4****	**-2.15****
	(1.334)	(1.034)	(1.126)			(0.9977)	(0.7438)	(0.7465)		(0.7665)	(0.721)
locim3	2.5		0.3							-0.4	
	(3.434)		(2.683)							(1.825)	
Locim4	2.6		0.4							0.2	
	(3.368)		(2.628)							(1.79)	
locim5	3.0		0.9							0.5	
	(3.378)		(2.636)							(1.811)	
Timesat3	-1.6		-0.5			-0.6	-0.4				
	(1.277)		(1.01)			(0.72)	(0.67)				
Timesat4	-0.5		0.0			0.0	0.0				
	(1.193)		(0.9618)			(0.6795)	(0.6512)				
Timesat5	-0.5		-0.1			0.0	0.1				
	(1.557)		(1.266)			(0.8566)	(0.7532)				

Variable	Model 1 B coef	Model 2 B coef	Model 3 B coef	Model 4 B coef	Model 5 B coef	Model 6 B coef	Model 7 B coef	Model 8 B coef	Model 9 B coef	Model 10 B coef	Model 11 B coef
Timetm2&3	10.1		12.6								
	(200)		(224)								
Timtm 4&5	1.0		0.8								
	(0.8406)		(0.6894)								
Stsat3	1.2		0.9				0.1				
	(1.159)		(0.9594)				(0.6615)				
Stsat4	1.0		0.6				-0.2				
	(1.195)		(1.008)				(0.646)				
Stsat5	-0.4		-0.3				-0.5				
	(1.32)		(1.168)				(0.729)				
Stim3		-1.1									
		(1.018)									
Stim4		-1.5									
		(0.9775)									
Stim5		**-1.714***									
		(0.9979)									
Gradsat3	-0.2		-0.3								
	(0.683)		(0.5831)								
Gradsat4	0.2		0.0								
	(0.8947)		(0.766)								
Gradsat5	-1.0		-1.2								
	(1.804)		(1.592)								
Misat3	**1.896****	0.8	**1.43****			**0.957****	0.5				
	(0.7449)	(0.4643)	(0.608)			(0.467)	(0.3667)				
Misat4	**2.169****	1.5	**1.62***			**1.62****	**1.018****				
	(1.084)	(0.6022)	(0.8439)			(0.71)	(0.4835)				
Misat5	1.6	0.4	1.4			-0.2	-0.5				
	(1.933)	(1.103)	(1.659)			(1.33)	(0.9618)				
Mimt2&3	15.7		16.8								
	(520)		(520)								
Mimt4&5	0.8		0.7								
	(0.6959)		(0.5831)								
Trainsat3	**1.55***		0.2			0.3					
	(0.8562)		(0.5955)			(0.5058)					
Trainsat4	0.0		-0.3			0.0					
	(1.025)		(0.8328)			(0.668)					
Trainsat5	1.8		0.6			-0.5					
	(2.955)		(2.361)			(1.75)					
Trainim3	**4.785***		2.8			1.8					
	(2.751)		(2.064)			(1.54)					
Trainim4	**5.46***		3.2			2.2					
	(2.812)		(2.05)			(1.523)					
Trainim5	**6.14****		3.2			2.1					
	(2.891)		(2.102)			(1.547)					
Trustsat3	0.4	0.1	0.4	0.6	0.6	0.8	0.6	0.7	0.6	0.6	
	(0.8282)	(0.611)	(0.75)	(0.6118)	(0.52)	(0.6459)	(0.5113)	(0.5277)	(0.6498)	(0.5407)	
Trustsat4	1.2	0.4	1.2	0.9	**1.51****	**1.48****	**1.58****	**1.694****	1.0	**1.63****	
	(1.015)	(0.6752)	(0.861)	(0.6661)	(0.5539)	(0.7344)	(0.541)	(0.5568)	(0.6971)	(0.5769)	
Trustsat5	0.4	0.4	0.9	1.3	**2.22****	0.9	**1.48***	**1.91****	1.5	**2.162****	
	(1.612)	(0.9895)	(1.32)	(0.9501)	(0.8287)	(1.152)	(0.8081)	(0.828)	(0.9854)	(0.8516)	
Trustim3	-2.6		-2.4			-2.0					
	(2.258)		(1.876)			(1.57)					
Trustim4	-3.0		-2.6			-2.1					
	(2.226)		(1.88)			(1.388)					
Trustim5	-2.1		-2.4			-1.0					
	(2.338)		(1.975)			(1.524)					
Divsat2									**1.2693***		
									(0.7147)		
Divsat3	0.6	0.4	0.5	0.4	0.2	0.4	0.1	0.3	**1.15***	0.3	**0.591***
	(0.71)	(0.4947)	(0.5886)	(0.4347)	(0.384)	(0.493)	(0.3948)	(0.3879)	(0.6616)	(0.3913)	(0.3521)
Divsat4	**1.99****	0.9	1.3	0.7	**1.37****	1.0	**1.004***	**1.08****	**1.50****	**1.01****	**1.896****
	(1.016)	(0.68)	(0.8578)	(0.6321)	(0.5184)	(0.69)	(0.5135)	(0.5257)	(0.8313)	(0.5367)	(0.4814)
Divsat5	1.6	0.9	1.8	0.6	**1.76****	1.4	**1.797****	**1.92****	1.5	1.1	**2.12****
	(1.465)	(1.05)	(1.327)	(1.04)	(0.8698)	(1.105)	(0.907)	(0.9261)	(1.166)	(0.9154)	(0.8345)
Divim3	-1.2	-0.8	-0.2			-0.5					
	(1.586)	(0.7574)	(1.233)			(0.9219)					
Divim4	1.2	0.1	1.6			1.0					
	(1.565)	(0.8045)	(1.226)			(0.9325)					
Divim5	0.2	0.1	1.4			1.0					
	(1.719)	(0.9224)	(1.323)			(1.054)					
Coopmem		**1.7****		**2.18****					**2.11****		
		(0.4772)		(0.41)					(0.4336)		
Sex	-0.2										
	(0.5877)										

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef	B coef
Age	0.0										
	(0.021)										
Income1		-0.7									
		(0.4194)									
Income2		-0.8									
		(0.6525)									
Income3		0.0									
		(0.741)									
Farmsize						0.0					
						(0.057)					
Ricesold					0.0						0.0
					(0.001555						(0.0017)
Soysold	2.354**		2.58**	1.525**	1.814**		1.713**	1.96**	1.73**	2.01**	1.764**
	(1.008)		(0.8305)	(0.6756)	(0.5879)		(0.5642)	(0.5785)	(0.7365)	(0.5884)	(0.5657)
Garlicsold	-2.752*		-2.0	-2.113**	-1.795*		-1.4	-1.5	2.346**	-1.2	-1.677*
	(1.64)		(1.52)	(1.002)	(0.945)		(0.8844)	(0.9542)	(1.117)	(0.9648)	(0.9519)
Perowned											
Subdistrict		0.6	1.05*	10.9		0.6		0.794**	11.0	0.703**	0.812**
		(0.4137)	(0.5853)	(195)		(0.4086)		(0.3499)	(191)	(0.3583)	(0.3305)
LONGAG1	1.74**	1.68**	1.87**	0.9682*	1.226**	1.7	1.55**	1.1917**	0.9439*	1.11**	1.102**
	(0.7308)	(0.5292)	(0.6153)	(0.5077)	(0.4755)	(0.5348)	(0.47)	(0.4433)	(0.528)	(0.4479)	(0.4595)
LONGAG2	1.567*	1.7**	1.85**	0.987*	0.974*	1.9	1.32**	0.99*	1.133*	0.8728*	0.8658*
	(0.8223)	(0.5756)	(0.6713)	(0.5506)	(0.5058)	(0.6064)	(0.5016)	(0.4861)	(0.5785)	(0.4961)	(0.4949)
LONGAG3					-0.3		-0.3				0.0
					(1.051)		(1.05)				(1.029)
EDUC1	-0.2				-0.2						
	(0.7994)				(0.4385)						
EDUC2	0.1				1.1						
	(1.358)				(0.777)						
EDUC3	0.1				-1.0						
	(1.675)				(0.9357)						
Vill0	1.5			1.793**					1.66**		
	(1.18)			(0.7307)					(0.7983)		
Vill1	1.88*			0.4					0.3		
	(1.058)			(0.7307)					(0.7523)		
Vill2	0.8			-0.6					-0.8		
	(1.237)			(0.6629)					(0.7288)		
Vill3	-0.5			-0.7					-0.8		
	(1.02)			(0.6486)					(0.6811)		
Vill4	1.3			0.1					0.0		
	(1.2)			(0.6169)					(0.6646)		
Vill5	0.2			0.0					-0.2		
	(1.412)			(0.7714)					(0.7964)		
Vill6	-2.9			-0.2					0.4		
	(1.845)			(1.244)					(1.348)		
Vill7	3.676**			-1.5**					1.575**		
	(1.24)			(0.6769)					(0.6991)		
Vill8	0.7			0.0					0.3		
	(0.9857)			(0.62)					(0.6794)		
Vill9	-1.6			-1.465**					-1.4		
	(1.592)			(0.744)					(0.8361)		
Vill10	0.0			0.0					-0.3		
	(1.478)			(0.9216)					(0.9664)		
Vill11	1.0			0.7					0.4		
	(1.241)			(0.6864)					(0.7735)		
Vill12	1.2			1.57*					2.086**		
	(1.51)			(0.9256)					(1.044)		
Mk2	3.33*	-1.2	2.63**			-2.274**				-1.2	
	(1.715)	(1.144)	(1.316)			(1.054)				(0.9285)	
Mk3	-2.5	-1.1	2.204*			2.087**				-1.3	
	(1.692)	(1.121)	(1.268)			(1.056)				(0.9003)	
Mk4	-1.2	-0.1	-0.8			-1.1				-0.3	
	(1.647)	(1.098)	(1.241)			(1.043)				(0.8759)	
Mk5	-1.4	0.0	-0.5			-1.2				0.2	
	(2.027)	(1.287)	(1.535)			(1.279)				(1.066)	
Chi-Sq.	227.7	174.2	205.7	158.6	122.9	165.6	116.4	128.5	171.0	132.3	111.3
(d.f.)	90.0	44.0	73.0	34.0	25.0	53.0	24.0	24.0	41.0	27.0	22.0
Rho	0.6	0.4	0.5	0.4	0.3	0.4	0.3	0.3	0.6	0.3	0.3
% correct	0.9	0.8	0.9	0.8	0.8		0.8	0.8	0.8	0.8	0.8

Estimated using the LIMDEP program
** significant at 99% significance level
* significant at 95% significance level
(d.f.) degrees of freedom

Appendix D : Multinomial Models

Multinomial Models: 0 wholesaler, 1 coop, 2 both

346 observations, 185 cooperative, 121 wholesalers, 40 both

Model 1

	wholesaler					coop				both					
	Marginal probability			MNL Coeffiecient			Marginal probability			MNL Coeffiecient			Marginal probability		
Variable	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat
Constant	0.052	0.1537	0.339	-0.29	0.686	-0.423	-0.078	0.1625	-0.477	0.123	0.695	0.177	0.0255	0.0515	0.495
Caim3	-0.091	0.2517	-0.361	0.3448	0.965	0.357	0.0422	0.2719	0.155	0.8035	1.074	0.748	0.0488	0.0729	0.669
Caim4	-0.113	0.2531	-0.448	0.569	0.951	0.598	0.1323	0.2778	0.476	0.133	1.1	0.121	-0.019	0.0719	-0.261
Caim5	0.0384	0.2631	0.146	-0.129	0.993	-0.13	-0.009	0.292	-0.029	-0.441	1.181	-0.373	-0.03	0.0779	-0.384
Casat3	-0.22	0.1531	-1.439	1.3947	0.554	**2.519**	0.4229	0.1927	2.195	-1.555	0.825	-1.885	-0.203	0.0707	-2.865
Casat4	-0.892	0.1732	-0.515	0.6891	0.575	1.198	0.2424	0.2117	1.145	-1.406	0.917	-1.534	-0.153	0.068	-2.251
Casat5	-0.159	0.2149	-0.738	0.8768	0.823	1.066	0.2314	0.2525	0.916	-0.322	1.126	-0.286	-0.073	0.0746	-0.975
CCim3	0.3833	0.2826	1.356	-1.79	1.044	*-1.714*	-0.371	0.284	-1.306	-1.276	1.14	-1.19	-0.012	0.0774	-0.158
CCim4	0.3507	0.2823	1.243	-1.647	1.041	-1.582	-0.344	0.2889	-1.192	-1.116	1.152	-0.969	-0.006	0.0773	-0.084
CCim5	0.2111	0.2782	0.759	-0.992	1.089	-0.911	-0.208	0.2993	-0.694	-0.665	1.231	-0.54	-0.003	0.0828	-0.04
CCsat3	0.1624	0.1542	1.053	-0.828	0.517	-1.6	-0.197	0.1813	-1.087	-0.106	0.778	-0.136	0.0346	0.0481	0.72
CCsat4	0.3514	0.187	1.879	-1.861	0.614	**-3.031**	-0.466	0.2191	-2.127	0.203	0.946	0.215	0.1146	0.0611	1.876
CCsat5	0.3786	0.2565	1.476	-1.896	0.979	*-1.93**	-0.44	0.2869	-1.532	-0.463	1.286	-0.36	0.061	0.0844	0.723
Trustsat3	-0.111	0.1447	-0.77	0.5552	0.497	1.116	0.1277	0.1602	0.797	0.1547	0.648	0.239	-0.016	0.0414	-0.393
Trustsat4	-0.297	0.1723	*-1.725*	1.3895	0.525	**2.647***	0.2884	0.1689	*1.708*	0.9822	0.695	1.413	0.0088	0.0448	0.179
Trustsat5	-0.326	0.2167	-1.505	1.5846	0.745	**2.128**	0.351	0.2304	1.523	0.6992	1.004	0.697	-0.025	0.0653	-0.383
Divim3	0.1066	0.161	0.662	-0.451	0.609	-0.741	-0.077	0.1723	-0.444	-0.646	0.681	-0.948	-0.03	0.046	-0.649
Divim4	-0.131	0.1631	-0.803	0.7123	0.609	1.171	0.1842	0.1801	1.023	-0.19	0.732	-0.259	-0.053	0.0499	-1.066
Divim5	-0.249	0.1937	-1.284	1.0668	0.692	1.542	0.1865	0.1926	0.968	1.4205	0.821	*1.731*	0.0622	0.5679	1.058
Divsat3	-0.169	0.1138	-1.486	0.8707	0.372	**2.338**	0.2099	0.1267	*1.656*	0.0599	0.536	0.112	-0.041	0.0349	-1.166
Divsat4	-0.265	0.1417	*-1.868*	1.4659	0.495	**2.964**	0.3878	0.1685	**2.301**	-0.555	0.749	-0.741	-0.123	0.0544	**2.263**
Divsat5	-0.214	0.1857	-1.153	1.1339	0.805	1.409	0.2839	0.2139	1.327	-0.122	1.031	-0.119	-0.07	0.0721	-0.966
Log ratio									126.21	(42)					
Rho									0.1917						
% correct									65.61						

Model 2

	wholesaler					coop				both					
	Marginal probability			MNL Coeffiecient			Marginal probability			MNL Coeffiecient			Marginal probability		
Variable	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat
Constant	0.1976	0.2866	0.689	-0.888	1.078	-0.824	-0.169	0.3232	-0.523	-0.837	1.338	-0.625	-0.286	0.1026	-0.278
Pricesat2	-0.265	0.2721	-0.972	1.3405	1.019	1.315	0.3095	0.3049	1.015	0.3709	1.245	0.298	-0.045	0.0957	-0.469
Pricesat3	-0.202	0.2674	-0.756	1.1612	1.001	1.16	0.3116	0.3056	1.019	-0.394	1.243	-0.317	-0.109	0.0966	-1.132
Pricesat4	-0.26	0.2685	-0.967	1.3498	1.002	1.346	0.3226	0.3017	1.069	0.1931	1.226	0.158	-0.063	0.0942	-0.669
Pricesat5	-0.209	0.2932	-0.714	1.0294	1.109	0.928	0.2277	0.329	0.692	0.4479	1.334	0.336	-0.018	0.1025	-0.18
Locsat3	0.0836	0.1164	0.719	-0.214	0.443	-0.484	0.017	0.1368	0.124	-1.152	0.634	-1.817	-0.101	0.0538	-1.869
Locsat4	0.2615	0.1191	**2.197***	-1.22	0.445	**-2.742**	-0.248	0.1249	-1.985	-0.889	0.58	-1.533	-0.014	0.0467	-0.291
Locsat5	0.3296	0.1906	*1.73*	-1.495	0.641	**2.334**	-0.29	0.2061	-1.405	-1.328	0.88	-1.509	-0.04	0.0678	-0.59
Misat3	-0.169	0.0975	*-1.728*	0.7542	0.295	**2.553**	0.1424	0.1067	1.335	0.7311	0.448	1.633	0.0262	0.0336	0.781
Misat4	-0.387	0.1354	**-2.861**	1.8872	0.389	**4.857**	0.4116	0.1388	**2.965**	0.9177	0.604	1.52	-0.024	0.044	-0.551
Misat5	-0.177	0.1925	-0.92	0.842	0.702	1.199	0.177	0.2239	0.79	0.5198	0.961	0.541	6E-05	0.0728	0.001
Log ratio									52.769	(20)					
Rho									0.0801						
% correct									0.5867						

Model 3

	wholesaler					coop				both					
	Marginal probability			MNL Coeffiecient			Marginal probability			MNL Coeffiecient			Marginal probability		
Variable	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat
Constant	0.4492	0.4225	1.063	-1.73	1.305	-1.326	-0.226	0.4243	-0.532	-3.522	1.609	-2.188	-0.224	0.1167	-1.916
Timesat3	-0.05	0.2476	-0.203	0.0244	0.573	0.043	-0.069	0.3058	-0.227	1.3227	1.281	1.033	0.1196	0.082	1.458
Timesat4	-0.023	0.2394	-0.095	-0.277	0.554	-0.501	-0.193	0.2967	-0.65	2.1871	1.246	*1.755*	0.2158	0.089	**2.419**
Timesat5	-0.08	0.2667	-0.3	0.291	0.652	0.446	0.0305	0.3275	0.093	0.7239	1.372	0.528	0.0496	0.0862	0.576
Stsat3	0.0369	0.1885	0.196	-0.143	0.578	-0.247	-0.019	0.2296	-0.083	-0.285	0.979	-0.291	-0.018	0.065	-0.275
Stsat4	0.0832	0.1863	0.447	-0.416	0.57	-0.73	-0.096	0.2257	-0.423	-0.125	0.961	-0.13	0.0122	0.064	0.191
Stsat5	0.1906	0.2104	0.906	-0.946	0.662	-1.429	-0.215	0.2466	-0.87	-0.328	1.049	-0.313	0.0239	0.0711	0.336
Misat3	-0.105	0.1055	-0.994	0.4648	0.357	1.301	0.0868	0.1169	0.742	0.4875	0.482	1.011	0.0181	0.034	0.533
Misat4	-0.221	0.1446	-1.532	1.1345	0.493	**2.302**	0.2689	0.1637	1.643	0.1881	0.704	0.267	-0.047	0.0497	-0.955
Misat5	-0.061	0.2779	-0.219	0.338	1.093	0.309	0.0885	0.3124	0.283	-0.092	1.294	-0.071	-0.028	0.0942	-0.294
Trainim3	-0.157	0.3293	-0.478	0.7757	1.267	0.612	0.1743	0.3448	0.505	0.2974	1.241	0.24	-0.017	0.0911	-0.187
Trainim4	-0.22	0.3254	-0.677	1.1349	1.242	0.913	0.2711	0.3394	0.799	0.1512	1.22	0.124	-0.051	0.0903	-0.562
Trainim5	-0.274	0.3355	-0.818	1.2746	1.267	1.006	0.2598	0.3457	0.751	0.9536	1.26	0.757	0.0146	0.0924	0.158
Trainsat3	02407	0.1027	0.235	-0.136	0.373	-0.365	-0.037	0.1199	-0.305	0.0514	0.507	0.101	0.0125	0.0356	0.351
Trainsat4	-0.005	0.1259	-0.043	-0.109	0.48	-0.228	-0.07	0.1471	-0.477	0.7585	0.642	1.181	0.0756	0.0506	1.495
Trainsat5	0.121	0.3285	0.368	-0.613	1.215	-0.504	-0.143	0.3839	-0.373	-0.14	1.647	-0.085	0.0221	0.1163	0.19
Coopmem	-0.414	0.1237	**-3.343**	2.11	0.298	**7.076**	0.4972	0.1042	**4.773**	0.4011	0.422	0.952	-0.083	0.0326	**-2.561**
Log ratio									**116.29**	(32)					
Rho									**0.1766**						
% correct									**0.6792**						

Model 4

	wholesaler					coop				both					
	Marginal probability			MNL Coeffiecient			Marginal probability			MNL Coeffiecient			Marginal probability		
Variable	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat	B coef.	S.D.	t-stat
Constant	-0.144	0.3432	-0.419	0.5317	1.555	0.342	0.064	0.3787	0.169	1.339	1.726	0.776	0.0799	0.1224	0.653
Inputsat3	0.0061	0.1121	0.072	-0.004	0.369	-0.011	0.0111	0.1303	0.085	-0.243	0.554	-0.44	-0.019	0.0332	-0.576
Inputsat4	-0.215	0.1218	*-1.768*	1.0881	0.396	**2.746**	0.2624	0.1295	**2.026**	0.0856	0.564	0.152	-0.047	0.036	-1.308
Inputsat5	-0.455	0.218	**-2.085**	2.0933	0.761	**2.749**	0.4379	0.2034	**2.152**	1.5179	0.994	1.527	0.0167	0.0657	0.255
Locim3	0.081	0.4072	0.199	0.1307	1.597	0.081	0.2089	0.4508	0.463	-3.572	1.982	*-1.802*	-0.29	0.1484	*-1.954*
Locim4	0.0337	0.3683	0.091	0.2261	1.556	0.145	0.1849	0.405	0.456	-2.613	1.801	-1.451	-0.219	0.1326	-1.649
Locim5	0.0751	0.3794	0.198	-0.08	1.575	-0.005	0.1203	0.4169	0.288	-2.467	1.844	-1.338	-0.195	0.1318	-1.482
Locsat3	0.0196	0.13	0.151	0.0771	0.484	0.159	0.0765	0.1532	0.5	-1.163	0.711	-1.635	-0.096	0.0522	*-1.842*
Locsat4	0.27	0.1492	*1.81*	-1.148	0.492	**-2.336**	-0.21	0.1426	-1.445	-1.524	0.666	**-2.29**	-0.064	0.0479	-1.336
Locsat5	0.4599	0.2377	*1.935*	-2.006	0.699	**-2.872**	-0.379	0.2162	*-1.754*	-2.269	0.943	**-2.405**	-0.081	0.0651	-1.239
Timesat3	-0.045	0.255	-0.175	-0.112	0.492	-0.228	-0.138	0.306	-0.451	2.235	1.293	*1.728*	0.183	0.0776	2.358
Timesat4	-0.074	0.2533	-0.293	-0.114	0.486	-0.234	-0.188	0.2957	-0.636	3.2365	1.252	**2.584**	0.2625	0.0897	2.927
Timesat5	-0.044	0.2647	-0.168	-0.034	0.555	-0.06	-0.093	0.3182	-0.293	1.7146	1.337	1.282	0.1378	0.077	1.789
Trustim3	0.2474	0.2364	1.046	-1.004	0.885	-1.135	-0.161	0.2503	-0.645	-1.712	1.101	-1.555	-0.086	0.076	-1.134
Trustim4	0.0456	0.2078	0.219	-0.047	0.857	-0.055	0.049	0.2311	0.212	-1.22	1.03	-1.182	-0.095	0.0729	-1.296
Trustim5	-0.161	0.2179	-0.741	0.8965	0.896	1.001	0.2428	0.244	0.995	-0.466	1.098	-0.424	-0.081	0.0743	-1.095
Log ratio									**95.226**	(30)					
Rho									**0.145**						
% correct									**0.6416**						

Estimated using the LIMDEP program
bold significant at 99% significance level
***italics and bold* significant at 95% significance level**
(d.f.) degrees of freedom

Appendix E : Correlation Analysis

Correlation Table, Spearman coefficient values

(from the highest values to the lower values)	
Ccim & Caim	0.79813
CCsat & CAsat	0.72026
Misat & Trainsat	0.65135
Stim & Stsat	0.64793
Trustsat &Divsat	0.61711
Trustim & Trustsat	0.60213
Caim & Casat	0.57574
Ccim & Casat	0.56141
Coopmem & Divim	0.56074
Trustim & Divim	0.55219
Divim & Divsat	0.55127
Coopmem & Divsat	0.51573
Locim & Timeim	0.48433
Timeim & Timesat	0.47907
TImeim & Timesat	0.47907
Trustsat & Divim	0.46848
Ccim & Ccsat	0.4674
Miim & Trainim	0.46542
Coopmem & Trustsat	0.44696
Timesat & Stsat	0.4211
Coopmem & Trustim	0.41211
Coopmem &Agent	0.38587
Trustim & Divsat	0.36315
Locim & TImesat	0.34233
Timeim & Stim	0.32254
Locsat & Timesat	0.31902
Trainsat & coopmem	0.30219
Coopmem & Locsat	0.24053

Appendix F: Banuk 'Onion' Cooperative

Onion Cooperative

The onion cooperative, established in 1984, had approximately 2100 members at the date of the interview on November 3, 1993. The cooperative membership had been relatively stable until up to the past year when membership fell by 334 members. The cooperative moved operations from Sanpatong townsite to the town of Maewang in the Maewang district just outside the Sanpatong district last year. The cooperative purchased onions from members and nonmembers in the Sanpatong and Maewang districts. There were only three employees at the cooperative serving the members and nonmembers. To be a member the farmer was to have grown onions in the past three years, have been over the age of 20 years, never have been rejected by the cooperative before, and not have credit owing at another organization to which the farmer had borrowed at the onion cooperative to pay off.

The price of onions was dependent on a grading system based on 4 different sizes. On the date of the interview, November 3, 1993, the price was 17 baht/kg but the price was usually much lower, varying from 7 baht/kg for grade 0 (largest) in January to 1 baht/kg for grade 3 (smallest) in January. The chart below illustrates the prices in 1993 as the following:

Chart 1: Prices for Onions, according to grade and the date

Grade	January	February	April
0	7 baht/kg	6 baht/kg	4 baht/kg
1	4 baht/kg	3 baht/kg	4 baht/kg
2	2 baht/kg	2 baht/kg	4 baht/kg
3	1 baht/kg	1 baht/kg	4 baht/kg

According to the manager, the cooperative could have controlled the price or narrowed the price range if the farmers had sold their produce to the cooperative. But when some of the farmers sold to the wholesaler and some to the cooperative, the result was wide deviations in the price

depending on the date of sale. The manager stated that the wholesaler would offer a better price initially to induce the farmer to bring the product to the wholesaler but once the farmers were coming to the wholesaler the price would come down. In other words, according to the cooperative mamager, the wholesaler was using predatory pricing to try to force the cooperative out of business.

The cooperative had in some years sold input supplies to the farmers but the decision on whether to sell inputs in any given year depended on the cooperative's financial resources available to purchase the supplies for selling to the farmers patronizing the cooperative. If the finances were available and the cooperative committee approved the purchase of inputs, the cooperative would make available chemicals, fertilizer, and seed for redistribution. The cooperative customarily arranged seed for each year because the government had given the cooperative the right to purchase imported onion seed treated for disease when the wholesalers were not granted the same privilege.[1] The cooperative was the sole purchaser in this district of imported onion seed while the wholesalers sold seed produced domestically that was usually of poorer quality and not treated for disease.

Credit for inputs from the cooperative had been available in the past but at the time of the interview, the cooperative did not have the financial resources to make credit available for inputs purchased by farmers. The cooperative arranged its own finances every year from the extension department of the government and the Organization for Agriculture. The cooperative could borrow from the extension department at 6% a year and from the Organization of Agriculture at no interest charge but the amount available to borrow in each year depended on the decisions by these two organizations linked to government.

The farmers transported their produce to the cooperative in Maewang at their own expensive. The cooperative did not have long-term storage and did not further process the product. When the farmers brought their produce to the cooperative, the cooperative arranged shipment by container

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[1]At the time of the interview farmers were publicly protesting that it was unfair to only allow the cooperative the right to redistribute imported onions.

truck to Bangkok for export. The cost of shipment of the product to Bangkok for each trip was 5000 baht/13,000 kgs or 0.385 baht/kg.

The cooperative paid the farmers for the product after the onions were either sold in Bangkok for export or sold domestically by the cooperative. The product was bought at 4 baht/kg by the cooperative and usually sold in Bangkok at 5 baht/kg. However last year the cooperative bought from the farmer at 7 baht/kg and sold the product at 5 baht/kg. According to the manager, the cooperative had no choice but to pay farmers the same price as offered by the wholesalers at 7 baht/kg. The cooperative lost four million baht in the 1992/93 year and issued no dividends. In fact, it was the researchers understanding that the cooperative had never issued dividends since its conception in 1985. If the cooperative had had profit they would have issued 3% back to the farmer-members.

The cooperative provided market price information to the farmers on a marketing board at the office in Maewang but did not give any further information unless asked. Moreover, the cooperative had not provided any training to the members in the past year, however, had it been possible, the manager expressed that he would have liked to have provided chemical, fertilizer, and management training. According to the manager, the cooperative didn't have the financial resources to provide anything more then the essential framework of the purchasing and selling the farmers produce. The manager implied that the cooperative was in a precarious state and that he was hoping the wholesalers and the farmers could work together cooperatively to improve the market structure. It was the manager's view that the present market structure allowed the cooperative to sell seed to the farmers but the farmers were not necessarily selling their product back to the cooperative. Some farmers sold their product to the wholesalers even though they may have agreed to sell their product to the cooperative. The cooperative needed to guarantee 4 million kgs of onions to a Bangkok firm to assure a contract for exporting to Japan.. If the cooperative could not get that volume of product

the contract would go to who ever could provide 4 million kgs of onions. Therefore, if the cooperative failed to obtain the contract, the cooperative had to sell the product domestically at a lower price. To get around this predicament, the cooperative manager asserted that he had wanted to sell directly to Japan but the Thailand government wouldn't give the cooperative authorization to sell directly for export. Thus , for the coming year when the interview was conducted, both the cooperative and the wholesaler were aggressively preparing for attempted struggle to get a high enough volume to obtain the contract from Bangkok. In spite of the present dilemma, the cooperative manager suggested that if the cooperative and wholesaler could cooperate together, it was his opinion that they could mutually secure a stable price to the producers and jointly exist in the same market.